Interpreting Course Descriptions

A typical course description in the Undergraduate Bulletin appears like this:

> **LIT-273 American Multicultural Literature 3 cr.**
> **HUM LIT ESA** Fall, Spring and Summer
> American multicultural literature, focusing on Hispanic, African, Asian and Native American writers. Equivalent to 326-373. P: ENGL-102, ENGL-112 or ENGL-113.

and is comprised of the following components, in order:

Subject Area Code

> **AEC** Architecture, Engineering and Construction
> **ANTH** Anthropology
> **APRL** Apparel Design/Manufacturing
> **APSC** Applied Science
> **ART** Art
> **ARTED** Art Education
> **ARTH** Art History
> **BIO** Biology
> **BUACT** Business Accounting
> **BUINB** Business International Business
> **BULGL** Business Legal
> **BUMGT** Business Management
> **BUMIS** Business Management Information Systems
> **BUMKG** Business Marketing
> **BURTL** Business Retail
> **CADD** CADD/Drafting
> **CAHSS** College of Arts, Humanites and Social Sciences
> **CEHHS** College of Education, Health and Human Sciences
> **CHEM** Chemistry
> **CNS** Cognitive Neuroscience
> **COUN** Counseling
> **CS** Computer Science
> **CTE** Career and Technical Education
> **DES** Design
> **ECE** Early Childhood Education
> **ECON** Economics
> **EDUC** Education
> **ELEC** Electricity/Electronics
> **ENGL** English
> **FCSE** Family and Consumer Sciences Education
> **FN** Food and Nutrition
> **FREN** French
> **GCM** Graphic Communications Management

GDD Game Design and Development
GEM Golf Enterprise Management
GEOG Geography
GER German
HDFS Human Development and Family Studies
HIST History
HLTED Health Education
HLTH Health
HT Hospitality and Tourism
INMGT Industrial Management
LIT Literature
LOG Logic
MATH Mathematics
MBE Marketing Education/Business Education
MECH Engineering Mechanics
MEDIA Media Technology
MFGE Manufacturing Engineering
MFGT Manufacturing Technology
MFT Marriage and Family Therapy
MSCS Mathematics, Statistics and Computer Science
MSL Military Science and Leadership
MUSIC Music
NANO Nanoscience/Nanotechnology
PE Physical Education and Athletics
PHIL Philosophy
PHYS Physics
PKG Packaging
POLS Political Science
POWER Power
PSYC Psychology
RC Risk Control
RD Design, Research and Development
REHAB Vocational Rehabilitation
SCIED Science Education
SCOUN School Counseling
SOC Sociology
SOCWK Social Work
SPAN Spanish
SPCOM Speech Communication
SPED Special Education
SRVM Service Management
STAT Statistics
STEM College of Science, Technology, Engineering and Mathematics

SUST Sustainability
TCS Telecommunication Systems
TECED Technology Education
TECH Technology
THEA Theatre
TRANS Transportation/Energy
TRDIS Transdisciplinary
TRHRD Training and Human Resource Development
WS Women's Studies

Course Level

The three digits of the course codes refer to the course level. The 100 series is primarily for freshmen; 200 – sophomores; 300 – juniors; and 400 – seniors.

Course Title

Credits

One credit hour usually represents one hour of class time per week plus two hours of out of class study.

Course Planning Information

Information on the second line of the course description helps you as you plan your course schedules.

General Education codes indicate the particular general education category the course applies to. See General Education Requirements for further clarification if needed.

COMMSK WRIT = Communication Skills -- Writing
COMMSK RDG = Communication Skills -- Reading
COMMSK SPK = Communication Skills -- Speaking
COMMSK LNG = Communication Skills -- Language

ANRSN STAT = Analytical Reasoning -- Statistics
ANRSN MATH = Analytical Reasoning -- Mathematics
ANRSN LOG = Analytical Reasoning -- Logic

H/PE ACTV = Health and Physical Education -- Activity
H/PE HLTH = Health and Physical Education -- Health

HUMART ARTMU = Humanities and the Arts -- Art History/Music Appreciation
HUMART CRPRF = Humanities and the Arts -- Creative/Performing Arts
HUMART HIST = Humanities and the Arts -- History
HUMART LIT = Humanities and the Arts -- Literature
HUMART PHIL = Humanities and the Arts -- Philosophy

SBSCI ANTH = Social and Behavioral Sciences -- Anthropology
SBSCI ECON = Social and Behavioral Sciences -- Economics
SBSCI GEOG = Social and Behavioral Sciences -- Geography
SBSCI POLS = Social and Behavioral Sciences -- Political Science
SBSCI PSYC = Social and Behavioral Sciences -- Psychology

SBSCI SOC = Social and Behavioral Sciences -- Sociology

NSCI LFSC = Natural Sciences -- Life Sciences
NSCI LFSC LAB = Natural Sciences -- Life Sciences Laboratory
NSCI PHYSC = Natural Sciences -- Physical Science
NSCI PHYSC LAB = Natural Sciences -- Physical Science Laboratory

TECH = Technology

INTER = Interdisciplinary Studies

Ethnic Studies courses are categorized as "A," "B," or "C" level and are coded **ESA**, **ESB** or **ESC**. See Ethnic Studies Requirements for further clarification if needed.

Global Perspective courses which fulfill the requirements for the global experience option are coded **GLP**. See Global Studies Requirements for further clarification if needed.

Terms Offered

The terms indicated — Fall, Spring, Summer and WinTerM — serve only as a general guide and do not guarantee that a course will be offered during a particular semester. Uncoded courses follow no usual pattern. Verify availability of a course in any given term by checking the online Open Courses listing or through Access Stout when planning your schedule.

Other Codes

P or Prerequisites: = Prerequisites are required as described.
$ = A special course fee applies.
R = Course is repeatable for credit.

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AEC Architecture, Engineering and Construction

AEC-131 Architectural Graphics (3 cr.)
Fall and Spring
Architectural drafting with emphasis on drawing theory and delineation. Drawing media and equipment are utilized in solving problems relating to construction that are normally solved graphically.

AEC-171 Light Construction Methods and Materials (3 cr.)
Fall and Spring
The building process, terminology, codes, materials, safety requirements, tools, and equipment used in the construction industry with emphasis on residential and small commercial structures.

AEC-172 Construction Technology (3 cr.)
Fal and Spring
Technology of constructing buildings, bridges and other structures, including: site preparation, foundation systems, superstructures, enclosures, utilities, finishing methods, and materials.

AEC-190 Orientation To Construction Industry (1 cr.)
Fall and Spring
An introduction to the field of construction as presented by professionals in the construction industry to broaden student understanding and develop appreciation of the entire scope of construction.

AEC-191 The Built Environment (2 cr.)
TECH
Construction and its relationship to resources, materials, and the culture in which it takes place. Discussion of significant historical and modern structures. Emphasis on how, why, and by whom structures are built and what can be learned from them.

AEC-233 Architectural Design I (3 cr.)
Fall and Spring
Develop graphic simulation techniques and problem-solving abilities related to the architectural effectuation process. Gain an understanding of site planning, residential space requirements, building codes, structure, finishes, mechanical and electrical systems. Prerequisites: take AEC-131.

AEC-237 Architectural Technology (3 cr.)
Fall and Spring
Space programming and planning, working drawings for commercial and industrial buildings. Building codes, energy requirements, construction contract documents, structural materials and systems, building materials and systems. Prerequisites: take AEC-131.

AEC-270 Heavy Construction Methods and Equipment (3 cr.)

Fall and Spring
Introduction to commercial and industrial building systems: equipment, site preparations, footings, foundations, formwork, concrete, steel, and wood timber techniques. Prerequisites: take AEC-171.

AEC-273 Concrete and Masonry Technology (3 cr.)
Fall and Spring
Fundamental principles of cement and concrete (ingredients, mixing, placement, finishing, curing, properties, and applications); clay and concrete units (ingredients, properties, manufacture, placement, and application). Prerequisites: take AEC-171; minimum grade C.

AEC-335 Architectural Design II (3 cr.)
Programming and analysis, design solution, presentation and design development drawings for commercial and/or public buildings; scale, site, codes, energy, acoustics, structure and their relation to form.

AEC-357 Site Engineering (3 cr.)
Fall and Spring
Use of surveying instruments, techniques, computations and computer technology used to measure and describe land configurations; construction surveying including contours, grades, cut and fill, and drainage. Prerequisites: take AEC-131 MATH-121.

AEC-370 Construction Estimating I (3 cr.)
Fall and Spring
Estimating and analyzing material, labor, equipment, methods of construction, overhead and profit, and submitting these factors in the form of a bid. Prerequisites: take AEC-237.

AEC-375 Construction Practicum (2-4 cr.)
Summer
Technical information, construction problems and actual development of light residential structure.

AEC-395 Seminar (1-2 cr.)
Summer
Masonry and procedures necessary for the implementation of masonry education into the school construction curriculum. **R**

AEC-438 Contract Requirements and Specifications (3 cr.)
Fall and Spring
Principles of contract requirements and construction specification organization. Development of basic skills of project manual preparation. Demonstration of role of specifications within the construction process and relationship to other construction contract documents. Prerequisites: take ENGL-320 or ENGL-415.

AEC-452 Environmental Systems -- HVAC (3 cr.)
Fall and Spring
Principles of heating, ventilating and air conditioning; analysis and selection of systems and equipment. Prerequisites: take PHYS-222, PHYS-241, or PHYS-281.

AEC-453 Environmental Systems -- Plumbing and Electrical (3 cr.)
Fall and Spring
Plumbing, electrical and illumination systems for light and heavy construction.

Prerequisites: take PHYS-232, PHYS-242, or PHYS-282.

AEC-458 Structural Systems -- Wood and Steel (3 cr.)
Fall and Spring
Analysis, selection, and delineation of wood and steel structural components and systems in buildings. Prerequisites: take PHYS-321.

AEC-459 Structural Systems -- Concrete and Masonry (3 cr.)
Fall and Spring
Analysis, selection, and delineation of concrete and masonry structural components and systems in buildings. Prerequisites: take AEC-458.

AEC-470 Construction Estimating II (3 cr.)
Fall and Spring
Total concept construction industry costs. Computer-based estimating systems for construction. Contracting, financing, take-off, pricing, bid preparation, resource and cost studies, control of costs and database operations.
Prerequisites: take AEC-370; minimum grade C.

AEC-471 Project Scheduling and Cost Control (3 cr.)
Fall and Spring
Total concept of construction industry: contracting, financing, bidding, planning, organizing, coordinating, and controlling functions and techniques. Prerequisites: take AEC-370; minimum grade C.

AEC-472 Management of Construction (3 cr.)
Fall and Spring
Organizing, managing and operating the contracting firm. Prerequisites: take BUMGT-304.

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ANTH Anthropology

ANTH-220 Cultural Anthropology (3 cr.)
SBSCI ANTH ESB GLP Fall, Spring and Summer
Introduction to concepts and methods; variability of culture; outline of cultural elements; processes of cultural change.

ANTH-250 The Human Past (3 cr.)
SBSCI ANTH Fall and Spring
Biological anthropology: humans as primates, origins of humans, stages of human evolution, and relationship of biology and culture.

ANTH-300 Native Americans (3 cr.)
SBSCI ANTH ESA Fall and Spring
North American Indians: native American cultures prior to European contact, Indian/European historical relationships and contemporary reservation/urban Indian life and issues.

ANTH-420 The Anthropological Study of Family Systems (3 cr.)
Spring
Anthropological, cross-cultural view of family systems, with attention to their organization, functions, dynamics and articulation with other institutions. Senior level or higher.

ANTH-430 Ojibwe Lifeways (2-4 cr.)
ESA Summer
Indepth, interactive study of Ojibwe culture within a Wisconsin reservation community. **$**

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APRL Apparel Design/Manufacturing

APRL-101 Introduction to Apparel Design and Development 3 cr.
Fall
Introduction to the apparel design process. Analysis of design elements and principles as related to aesthetics of apparel. Cultural influences on the aesthetic response and fashion acceptance.

APRL-140 Textiles 3 cr.
Fall and Spring
Selection, use and care of clothing and household fabrics: analysis of their components.

APRL-145 Interior Decorating/Design Textiles 3 cr.
Fall and Spring
Fibers and fabrics used in design/decorating planning of residential and commercial settings.

APRL-166 Apparel Construction 3 cr.
Fall and Spring
Construction theory and principles of fitting applied to garment construction.

APRL-180 Pattern Development 3 cr.
Fall and Spring
Develop patterns for garments by flat patterning, drafting, and draping methods.
Proficiency in Apparel Constr.

APRL-185 Apparel Line Development 3 cr.
Spring
Develop and present apparel lines for specific markets.

APRL-202 Quality Analysis of Sewn Products 3 cr.
Fall and Spring
Factors that influence quality levels in manufactured apparel and other sewn products.
Prerequisites: take APRL-140.

APRL-211 History of Fashion-19th Century to Present 3 cr.
Spring
A study of the evolution of fashion from the 19th century to the present concentrating on the impact of the fashion designer and changing fashion trends.

APRL-250 Textile Evaluation 3 cr.
Fall
Problems in fiber identification, fabric performance and care; chemical and microscopic

testing procedures; methods for gathering and interpreting data; individual problems. Prerequisites: take APRL-140.

APRL-274 Fashion Industry 3 cr.
GLP Fall
Processes/functional areas in a sewn product enterprise.

APRL-275 Apparel Grading/Marker Making 3 cr.
Spring
Size grade apparel patterns for various figure types. Make markers and plan cutting of fabric.

APRL-345 Textiles For Interiors 2 cr.
Spring
Raw materials, fabric structures, specifications, and legislation related to quality, performance, and maintenance of textiles for commercial and household uses. Prerequisites: take APRL-140.

APRL-355 Special Topics in Apparel Design/ Manufacturing 1-3 cr.
Special topics in clothing and textiles. **R** Repeatable for different topics.

APRL-367 Engineered Tailoring 3 cr.
Fall
Industrial production methods applied to construction of tailored garments. Prerequisites: take APRL-166.

APRL-368 Experimental Clothing 3 cr.
Spring
Application of problem-solving techniques in designing and constructing garments using client approach. Prerequisites: take BURTL-112 APRL-140.

APRL-381 Functional Clothing Design 3 cr.
Fall
Application of physical science theory to problems in clothing design: impact protection and thermal balance of the human body, structural properties of materials, and apparel forms. Prerequisites: take APRL-180.

APRL-382 Advanced Pattern Development 3 cr.
Fall and Spring
Develop advanced patterns for garments by draping fabric and using a computer-aided design system. Prerequisites: take APRL-180.

APRL-385 CAD for Apparel Images 3 cr.
Fall and Spring
Create apparel and patterned textile images using CAD to create professional presentations appropriate to the fashion industries. Prerequisites: take APRL-185.

APRL-390 Practicum in Textile Design 3 cr.
Use of textile design techniques as means of artistic expression: stitchery, weaving, knotting, applique and hooking; emphasis on good design and creativity. Prerequisites: take ART-101.

APRL-394 Knit Design and Technology 3 cr.
Fall and Spring
Stitch formation and patterning of warp and filling knits. Influences on aesthetics and performance of knit fabrics. Design and production of knitted fabric and garments on a flat bed knitting machine, including use of CAD techniques. Prerequisites: take APRL-140 APRL-285.

APRL-405 International Study Tour to the Fashion Industry 1-6 cr.
Spring
Tour of international centers of clothing, textiles, and related arts. Study of the cultural patterns. Program includes lectures by consultants and seminars on the various phases of the fashion and fabric industries. **R**

APRL-410 History of Costume — Ancient to European 3 cr.
Fall
Development of costume throughout the ages: fashion as it reflects past cultures and influences present day costume.

APRL-419 National Study Tour to Fashion Industry 1 cr.
Fall and Spring
Five-day visit to New York or alternate city: study hours, discussions and lectures by leaders in American fashion market. Junior Level or Higher. **R**

APRL-470 Portfolio Development For Apparel Design And Development 3 cr.
Fall and Spring
A capstone course: resume and job search development; organization and updating projects from previous courses; creation of new portfolio projects that display a high level of apparel design and development skills and competencies. Prerequisites: take APRL-381, APRL-382, APRL-385, and APRL-394.

APRL-474 Apparel Product Development 3 cr.
Spring
Capstone course incorporating soft goods industrial and managerial techniques for production simulation of apparel product development. Prerequisites: take APRL-180 APRL-202 APRL-274.

APRL-480 Draping 3 cr.
Fall
Application of draping principles in design and construction of garments; emphasis on creativity.

APRL-485 Apparel Design Studio 3 cr.
Spring
Creation, development, and formal presentation of original designs using flat pattern and/or draping techniques. Preparation of professional portfolio to include CAD and other illustrative materials representative of individual expertise.

APRL-495 Historic and Contemporary Fabrics 3 cr.
Fall
Analysis of designs and techniques of decorating historic and contemporary fabrics; contribution of decorative fabrics to enrichment of human experience.

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APSS Applied Social Science

APSS-100 Introduction to Applied Social Science (1 cr.)
Fall and Spring
Introduction to social science ideas, ethics and practices. Acquaints students with the Applied Social Science program structure and choices, as well as potential job opportunities in the field.

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APSC Applied Science

APSC-101 Applied Science Profession I 1 cr.
Fall and Spring
Exploration of career areas of interest; examine appropriate interpretations of scientific measurements and experimental design.

APSC-311 Issues for Science Professionals 3 cr.
Fall and Spring
Proprietorial, ethical, and legal issues affecting the careers of science professionals. Junior level or higher.
Prerequisites: take PHIL-235.

APSC-398 Field Experience in Applied Science 1-6 cr.
Field experience in Applied Science in an approved position. Guidelines for credit to follow those developed by the university for co-op experiences. Students responsible for an oral presentation and a written report.

APSC-401 Applied Science Profession II 1 cr.
Fall and Spring
Preparation for the science profession. Assess knowledge base, identify areas of strengths and weaknesses, define plan for further development. Build a professional portfolio and resume, and review interviewing skills. Explore methods of strategic planning and analysis for science professionals. Senior Level Or Higher.

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ART Art

ART-100 Drawing I (3 cr.)
HUM CRPRF
Fall and Spring
Study and application of the principles and mechanics of descriptive freehand drawing using black and white media.

ART-101 Two-Dimensional Design Foundations (3 cr.)
HUM CRPRF
Fall and Spring
Principles and elements of two-dimensional design and their application to the foundations of visual expression.

ART-102 Introduction to Art and Design (1 cr.)
Fall and Spring
Introduction to various disciplines and activities in art and design. Not appropriate for General Education requirement.

ART-103 Three-Dimensional Design Foundations (3 cr.)
Fall and Spring
The study of the principles and elements of three-dimensional design and their application to the foundations of visual expression.
Prerequisites: take ART-101.

ART-114 Color Studio (3 cr.)
Fall, Spring and Summer
Students apply color knowledge to art and design exercises. Content covered includes the physical properties of color, the schools of color theory and influential color theorists, and color vocabulary.

ART-145 The Practice of Art (3 cr.)
Summer
Introduction to current professional practices and historical roles of artists in culture. Studio Art or Art Ed Majors only.

ART-200 Drawing II (3 cr.)
Fall and Spring
Study and application of the principles and mechanics of interpretive freehand drawing focusing on invention, and creative investigation using a variety of black and white, color, and mixed media. Prerequisites: take ART-100. **R**

ART-209 Painting I (3 cr.)
Fall, Spring and Summer

Introduction and investigation of acrylic and/or oil painting.
Prerequisites: take ART-200.

ART-211 Sculpture I (3 cr.)
Fall and Spring
Introduction to sculptural concepts.
Prerequisites: take ART-103.

ART-213 Ceramics I (3 cr.)
HUM CRPRF
Fall, Spring and Summer
Basic design and techniques of ceramic production for artist/potter; forming, firing and surface treatment.

ART-215 Art Metal I (3 cr.)
HUM CRPRF
Fall, Spring and Summer
Design and construction of jewelry and objects in precious and non-precious materials with relationship to human interaction.

ART-217 Printmaking I (3 cr.)
Fall, Spring and Summer
Introduction to the concepts and techniques of printmaking.
Prerequisites: take ART-101 and ART-200.

ART-256 Art Workshop (1-3 cr.)
Fall, Spring and Summer
Selected art concepts, processes and media will vary to serve special student populations. Credit determined by individual contract.

ART-300 Drawing III (3 cr.)
Advanced Drawing methodologies with emphasis on media exploration, furthering drawing strategies, exposure to historical and current drawing concerns and independent research.
Prerequisites: ART-200. **R**

ART-301 Life Drawing I (3 cr.)
Fall and Spring
Drawing and analyzing the human figure and other natural forms. Translating three-dimensional form to the two-dimensional picture plane.
Prerequisites: take ART-200.

ART-307 Aesthetics and Contemporary Art Theory (3 cr.)
Fall and Spring
Introduction to the problems of aesthetics and contemporary art theory, e.g., interpretation, creation, and experience of art.
Prerequisites: take ARTH-223, ARTH-224, and ART-145; and take ARTH-336 or ARTH-337.

ART-401 Life Drawing II (1-3 cr.)
Fall and Spring
Advanced problems in figure composition and graphic interpretation of the figure. Initial enrollment must be for 3 credits.
Prerequisites: take ART-301. **R**

ART-409 Painting II(1-3 cr.)
Fall, Spring and Summer
Continued investigation of painting issues with a broader range of technical concerns, historical and contemporary approaches through expanded research requirements.
Prerequisites: take ART-209. **R**

ART-410 Painting III (3 cr.)
Fall and Spring
Self-directed study of painting. Continued development of individual research, painting skills, and studio discipline.
Prerequisites: take ART-409.

ART-411 Sculpture II (1-3 cr.)
Fall and Spring
Advanced problems in sculpture; exploitation of media for creative and expressive ends. Initial enrollment must be for 3 credits.
Prerequisites: take ART-211. **R**

ART-413 Ceramics II (1-3 cr.)
Fall, Spring and Summer
Use of clay, glazes and kiln for design and production of high-fired ceramics. Initial enrollment must be for 3 credits.
Prerequisites: take ART-213. **R**

ART-414 Color Seminar (4 cr.)
Fall and Spring
A case-study course exploring methodologies for use of color. Content includes gender-specific, historic, psychological, social, and symbolic use of color; color sensibilities in other cultures; and roots of color beliefs.
Prerequisites: take PHYS-150, PSYC-432, GCM-367 and ART-114.

ART-415 Art Metal II (1-3 cr.)
Fall, Spring and Summer
Advanced problems in design and construction of jewelry, hollow forms and objects in precious and non-precious materials. Initial enrollment must be for 3 credits.
Prerequisites: take ART-215. **R**

ART-417 Printmaking II (1-3 cr.)
Fall, Spring and Summer
Advanced work in the processes of relief, silkscreen, etching or lithographic printmaking. Initial enrollment must be for 3 credits.
Prerequisites: take ART-217. **R**

ART-445 Senior Seminar (1 cr.)
Summer
Professional practice including portfolio and senior exhibition; current ideas and career opportunities within the art profession. Senior Level Or Higher. Studio Art or Art Ed Mj Only. Prerequisites: take ART-145 and ART-307 (can be taken concurrently)

ART-456 Advanced Art Workshop (1-3 cr.)
Selected art concepts, processes and media will vary to serve special student populations.

For students familiar with workshop approach or advanced in art program. Credit determined by individual contract. **R**

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ARTED Art Education

ARTED-108 Introduction To Art Education (2 cr.)
Fall
Introduction to the Art education field, responsibilities of art teachers, literature, and current issues in the profession.

ARTED-208 Preteaching Observation (2 cr.)
Fall
Examination of K-12 art teaching methods and practices through on-site observations, discussion and related coursework. Required 30 hours of K-12 art classroom observation. Education majors only; must have completed Benchmark I.
Prerequisites: take ARTED-108.

ARTED-308 K-12 Art Education Theory, Methods, and Practice (4 cr.)
Spring
Theory, methods, and curriculum development in art education including K-12 art teaching practicum in selected elementary and secondary art classrooms. Education majors only; must have completed Benchmark I.

ARTED-408 Student Teaching in Art Education — Elementary (8 cr.)
Fall and Spring
Directed teaching in elementary art; required student teaching seminars, on-line course participation, and completion of portfolio. Education majors only; must have completed Benchmark I.

ARTED-409 Student Teaching in Art Education — Secondary (8 cr.)
Fall and Spring
Directed teaching in secondary art; required student teaching seminars, on-line course participation, and completion of portfolio. Education majors only; must have completed Benchmark I.

ARTED-488 Intern Teaching: Art Education (8-16 cr.)
Fall and Spring
Alternative method of obtaining Art Education student teaching experience. Interns receive license to teach and salaried appointment in a cooperating school for one semester. School of Education permission required.
Prerequisites: take ARTED-208, EDUC-303, EDUC-312, EDUC-326, EDUC-336, EDUC-376, EDUC-382, SPED-430.

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ARTH Art History

ARTH-222 Introduction To Art (3 cr.)
HUM/ARTMU
Fall
Art appreciation and historical survey for the non-art major.

ARTH-223 Survey of Art--Ancient Through Medieval (3 cr.)
HUM/ARTMU
The painting, sculpture, architecture and minor arts in the ancient western world.

ARTH-224 Survey of Art-Renaissance through 20th Century (3 cr.)
HUM/ARTMU
Sculpture, painting, architecture and minor arts of western world from fourteenth century to present.

ARTH-225 Introduction to Non-Western Art (3 cr.)
GLP
Cross cultural examination of the history of Non-Western art from a global perspective. Exploration of the arts of Asia, Africa, the Americas, Oceania, and the Islamic world. Exposure to diverse visual elements and humanistic concerns. Themes include: diversity, identity, religion, politics, representation of self and "the other", and Westernization.

ARTH-250 British Art, Architecture, and Design (3 cr.)
HUM/ARTMU GLP
Summer
Survey of the art, architecture, and design of Great Britain, with travel to the British Isles.

ARTH-256 Special Topics in Art History (3 cr.)
Study of topics not covered in existing Art History courses, or more detailed study of a topic introduced, but not emphasized, in existing Art History courses.

ARTH-319 History of Design (3 cr.)
Summer
Survey of the history of modern design since its origins in the late Renaissance. Prerequisites: take ARTH-224 and ENGL-101, or take ARTH-224 and ENGL-111.

ARTH-326 Greek and Roman Art (3 cr.)
The arts of ancient Greece and Rome.

ARTH-327 Medieval Art (3 cr.)
The arts of Europe and Byzantium from late Roman Empire to end of Middle Ages.

ARTH-328 Italian Renaissance Art (3 cr.)

A chronological, geographic, and thematic survey of art and architecture in Italy from the Fourteenth through the Sixteenth Centuries.

ARTH-329 Northern Renaissance Art (3 cr.)
A chronological, geographic, and thematic survey of art in Northern Europe during the late fourteenth, fifteenth, and sixteenth centuries.

ARTH-330 Baroque Art (3 cr.)
A chronological, geographic and thematic survey of art and architecture in Europe and the colonial New World in the seventeenth and early eighteenth centuries.

ARTH-332 Gender and Art (3 cr.)
Spring
Exploration of social and cultural constructions of identity and sexuality from Prehistory to the Modern era. Analysis of the ways in which gender identities can be shaped by politics, religion, and culture, and how an artist's gender and/or sexual preferences affect visual imagery, from subject choices to market values.

ARTH-333 History of Interiors and Furnishings (3 cr.)
GLP Fall
Survey of the history of interior design, furniture, and househould objects since ancient Egypt.

ARTH-335 19th Century Art in Europe (3 cr.)
History of European art from about 1800 to 1900.

ARTH-336 Modern Art (3 cr.)
Fall
The main currents and developments in art from Monet and Cezzane to 1950.

ARTH-337 Art Since 1950 (3 cr.)
Developments in painting and sculpture in Europe and America since 1950. Prerequisites: take ARTH-224.

ARTH-339 Japanese Art and Culture (3 cr.)
GLP
Thematic survey of the art and culture of Japan from pre-history to the present day. Recognition of major styles, appreciation of Eastern cultural ideals, familiarity with influences and borrowings from the West. Class discussions include religion (Shinto, Buddhism), art, culture (tea ceremonies, Kabuki Theater) and literature.

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BIO Biology

BIO-101 Introductory Biology (4 cr.)
NSCI LFSC LAB
Fall and Spring
Introduction to the science of biology including life processes, cell biology, genetics, molecular biology, evolution, ecology, plant and animal diversity. Life systems are viewed from the sub-cellular to the community level, emphasizing the diversity, functioning, and interaction of whole organisms.

BIO-111 Science, Society, and the Environment (4 cr.)
NSCI LFSC LAB GLP
Fall and Spring
Relationship of humans to the natural environment. Ecological principles in relation to contemporary problems such as resource utilization, species extinction, human population dynamics, waste, and pollution generation and control. **$**

BIO-122 Introductory Biology (3 cr.)
NSCI LFSC LAB
Principles of biology: cellular metabolism, heredity and relationships between living organisms and their environments, with laboratory.

BIO-125 Biology of Aging (3 cr.)
NSCI LFSC
Understanding the aging process. Physiological, demographic, immunological and overall health aspects of aging.

BIO-128 Community Health (2 cr.)
HPE HLTH
Summer and Winterm
Disease prevention through education, sanitation, isolation and immunization; public health programs and operation of federal and state laws.

BIO-130 Human Sexual Biology (3 cr.)
NSCI LFSC
Male and female differentiation, development, structure, function and diseases of the reproductive system. Sperm and ovum production, fertility control, pregnancy, birth and lactation, mechanisms and patterns of inheritance.

BIO-132 Human Biology (4 cr.)
NSCI LFSC LAB
Fall and Spring
Basic concepts of physiological processes and anatomy of all organ systems of humans, based on dissection of a cat; embryological development.

BIO-135 Organismal Biology (4 cr.)

Fall
Introduction to the biological sciences, including evolution, an overview of life's diversity, plant biology, animal biology, and ecology. Emphasis on scientific thought processes, laboratory skills, and communication skills. H.S. Biology required; for Applied Science majors only.

BIO-136 College Molecular Cell Biology I (5 cr.)
Fall and Spring
Introduction to the biological sciences, including cell biology, physiology, and molecular biology. Emphasis on scientific thought processes, laboratory skills, and communication skills. For Applied Science majors and Biology minors.

BIO-141 Plants and People (4 cr.)
NSCI LFSC LAB GLP
Investigation into the global economic and cultural importance of plants, how aspects of plant biology have played historical roles in shaping societies around the world, and the roles of plants in solving future societal problems.

BIO-150 Environmental Science (2 cr.)
NSCI LFSC GLP
The relationship of humans to the natural environment. Study of ecological principles in relation to contemporary problems such as resource utilization, human population dynamics, waste and pollution control.

BIO-210 Concepts and Issues in Biotechnology (2 cr.)
NSCI LFSC TECH GLP
Summer and Winterm
Concepts and issues in the field of Biotechnology. Overview of stem cell research, cloning, tissue engineering, artificial organs, genetically modified foods, and others as appropriate.

BIO-220 Physiology of Disabilities (3 cr.)
Spring
Causes, consequences, prognoses and treatments of diseases and injuries common in today's society. Includes genetic disorders, birth defects, cancers, degenerative disorders, spinal cord injuries, cardiovascular abnormalities and immune disorders.
Prerequisite: take BIO-132 or BIO-134.

BIO-234 Physiology and Anatomy (4 cr.)
NSCI LFSC LAB
Fall and Spring
The structure and function of the human organism at the cellular, organ, and organism levels with emphasis on the physiological control systems and the concept of homeostasis as the unifying concept in physiology.
Prerequisites: take BIO-101, CHEM-125 or CHEM-135.

BIO-235 Molecular Cell Biology II (4 cr.)
Spring
Consideration of eukaryotic cell structure, function and processes.
Prerequisites: take BIO-136 CHEM-136.

BIO-242 Botany (4 cr.)
NSCI LFSC LAB

Introduction to structure and function of plants, survey of plant kingdom, and structure and life history of representative forms of plant life.

BIO-252 Zoology (4 cr.)
Investigation of vertebrate and invertebrate animal life. Diversity, physiology and adaptation of the animal species.

BIO-255 The Biology of Fly Fishing (2 cr.)
NSCI LFSC
The science and art of fly fishing. Research aquatic environments and ecosystem dynamics to understand the relationship between fish and the world around them. Gain exposure to aquatic ecology, fish and insect identification and behavior, and fly tying.

BIO-260 Ichthyology - Wisconsin Fishes (4 cr.)
NSCI LFSC LAB
Summer
Introduction to the study of fishes, including morphology, taxonomy, classification, evolution, behavior, and general ecology of fishes. Special emphases on field identification of Wisconsin fishes, management of Wisconsin fish populations, and global conservation of fishes.

BIO-306 General Microbiology (4 cr.)
Fall and Spring
Introduction to microbial life forms including Archaea, Bacteria, and Eukarya. Survey of microbial cell biology, physiology, molecular biology, ecology, and pathogenesis. Bacteriological and molecular methods used to identify microorganisms in natural and artificial environments. Prerequisite: take BIO-101 or take 1 CHEM course.

BIO-322 Plant Pathology (3 cr.)
Survey of the principles and concepts of plant pathology, including the impact of plant disease to crop production, environment and society.
Prerequisites: take BIO-242.

BIO-324 Vascular Plant Taxonomy (3 cr.)
Plant classification, identification, and evolution. Focus on flowering plant families of the Upper Midwest. Field trips and plant collection required.
Prerequisites: take BIO-242.

BIO-332 Genetics (3 cr.)
Fundamental principles of genetics, from Mendel
to the present; applications to plants, animals and humans. Laboratory reinforces principles studied in lecture and includes performance of genetic crosses, the cell, mitosis/meiosis, use of mathematical tools to analyze data, gene mapping, karyotyping, pedigree analysis, and the concepts of transformation/transduction.
Prerequisites: take BIO-101.

BIO-343 Plant Physiology (4 cr.)
Spring
The study of the fundamental physiological processes of plants including investigation of the mechanical, physical and biochemical functions of plants.
Prerequisites: take BIO-242 and 100-level CHEM or higher.

BIO-350 Ecology (3 cr.)
Interrelationships of organisms with their abiotic and biotic environments.
Prerequisites: take BIO-111 or BIO-135 or BIO-141.

BIO-351 Ecology Laboratory (2 cr.)
LAB
Applications of ecological methods to answering ecological questions, including research study development, data analysis, and interpretation.
Prerequisites: take BIO-350 or concurrent enrollment.

BIO-352 Plant Ecology (4 cr.)
Investigation into factors affecting the distribution and abundance of plants. Laboratory and discussion emphasis on using field sampling, GIS, current research, and restoration techniques to identify and solve plant resource management problems. Weekend field trip (s) required.
Prerequisites: take BIO-242.

BIO-358 Introductory Pharmacology (2 cr.)
Discussion of the sites and mechanisms of drug action, mechanisms of drug distribution, biotransformation and elimination. Analgesics and psychoactive drugs, drugs used clinically to impact cardiovascular care and to manipulate the reproductive system.
Prerequisite: take BIO-132, BIO-234 or CHEM-135.

BIO-360 Introduction to Neuroscience (3 cr.)
Investigation of the human nervous system at the molecular, cellular and system level. Organization and function of neuronal cells, sensory receptors, sensory and motor pathways and integration centers. Introduction to electro- physiology, biochemistry of neurotransmitters and receptors, neuropharmacology, development of the nervous system, and consequences of neuronal disease and trauma.
Prerequisite: take BIO-132 or BIO-234.

BIO-361 Psychobiology (2 cr.)
Biological basis of human and animal behavior: evolution of physiological and behavioral adaptations of organisms to their environment.

BIO-362 Advanced Physiology (3 cr.)
Fall and Spring
Human physiology with emphasis on integration of the nervous, muscular, cardiovascular, immune, renal, respiratory, digestive and endocrine systems. Cellular and molecular processes are studied. Computer simulations and experiments in frog physiology will be utilized.
Prerequisite: take BIO-234.

BIO-370 Biotechnology (3 cr.)
Spring
Theoretical and laboratory experience in recombinant DNA techniques and their applications in the biotechnology industry.
Prerequisites: take CHEM-201 and BIO-235.

BIO-372 Plant Biotechnology (3 cr.)
Fall
Presents an overview of the techniques and underlying theory of plant tissue culture and

genetic engineering, research and commercial application, and issues/challenges in the area of plant biotechnology.
Prerequisites: take BIO-136, BIO-235 and BIO-242.

BIO-400 Special Topics in Biotechnology (1-2 cr.)
Fall and Spring
Topics of current or historical importance in the understanding of biotechnology. Designated topics announced prior to start of semester. May be repeated for elective credit. Junior Level Or Higher. **R**

BIO-406 Food Microbiology (3 cr.)
Methods of food preservation, their effectiveness and related food spoilage by microorganisms. Quality control techniques used to determine presence of specific groups of economically important microorganisms.
Prerequisite: take BIO-306.

BIO-425 Proteomics (3 cr.)
This course provides state-of-the-art training in proteomics. Students will solve biological research questions and operate proteomics equipment such as chromatography devices and mass spectrometers.
Prerequisite: take BIO-235 and concurrent enrollment in CHEM-311, or consent of instructor.

BIO-444 Problems in Environmental Sustainability (3 cr.)
Integrate knowledge, theory, and practice from the humanities, social and natural sciences to explore current environmental issues and challenges. Junior Level Or Higher.
Prerequisites: take BIO-350.

BIO-470 Advanced Biotechnology (5 cr.)
Spring
Molecular biotechnology, including manipulation of prokaryotic and eukaryotic cells, computer analysis of genomic and proteomic data, and applications in the biotechnology industry. Prerequisites: take BIO-235 and BIO-370.

BIO-489 Advanced Biology Experience (1-4 cr.)
Fall, Spring and Summer
Experiences leading to deeper understanding of biological principles. Junior level or higher. **R**

BIO-493 Bioinformatics Practicum (3 cr.)
Spring
Experiences leading to a deeper understanding of bioinformatics through participation in a "linked-courses" interdisciplinary learning community. Students will complete a faculty-advised semester research project, write a senior thesis describing their project, present the results in an appropriate research forum, and participate in the learning community journal club.
Prerequisites: take MSCS-492.

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BUACT Business Accounting

BUACT-200 Financial-Managerial Accounting – Engineering Technology (2 cr.)
Fall and Spring
Survey of financial accounting concepts for a sole proprietorship, partnership, and corporation. Managerial accounting concepts will be covered in use of the annual report, with emphasis on financial statement analysis.

BUACT-201 Financial-Managerial Accounting (3 cr.)
Fall and Spring
Survey of financial accounting concepts for a sole proprietorship, partnership and corporation. Managerial accounting concepts will be covered in the use of the annual report, with emphasis on financial statement analysis including the cash flow statement and budgets. For Engineering Technology and Industrial Management majors only.

BUACT-206 Introduction to Financial Accounting (3 cr.)
Fall, Spring and Summer
Theory of debit and credit, principles of accounting records, modern business papers, working sheets, balance sheets and income statements, and sole proprietorships. Sophomore level or higher.

BUACT-207 Introduction - Corporate and Managerial Accounting (3 cr.)
Fall, Spring and Summer
Development of basic accounting theory from BUACT-206: partnership and corporate forms of organization; branch and manufacturing accounting; cost accounting, budgeting and analysis and interpretation of financial statements. Prerequisites: take BUACT-206.

BUACT-312 Cost Accounting (3 cr.)
Fall and Spring
Emphasis on concepts and techniques of cost analysis. Application of cost information and discussion of techniques and budgeting. Equivalent to BUACT-410. Prerequisites: take BUACT-206.

BUACT-320 Income Tax Accounting (3 cr.)
Fall and Spring
General concepts of U.S. tax law and its effect on individual, partnership, and corporate decisions; computation of federal and state taxes for individuals. Prerequisites: take BUACT-206.

BUACT-335 Accounting for Management Decisions (3 cr.)
Fall and Spring
Interpretation of financial statements, internal control, budgeting, costing of products manufactured and sold, analysis of cost-volume- profit decisions. Data presented without mechanical techniques. Prerequisites: take BUACT-207.

BUACT-340 Business Finance (3 cr.)
Fall, Spring and Summer
Concepts of raising, allocating and controlling capital for business entities; analysis of the income tax system and its relevance with business decisions; analysis of financial data in making investment decisions. Prerequisites: take BUACT-207 and STAT-130 and MATH-123.

BUACT-346 Seminar (1-3 cr.)
Current topics in business. (Title will reflect specific business content.) **R**

BUACT-410 Manufacturing Cost Analysis (3 cr.)
Fall and Spring
Emphasis on concepts and techniques of cost analysis. Application of cost information and discussion of techniques and budgeting for a manufacturer. Equivalent to BUACT-312. Prerequisites: take BUACT-206 or BUACT-201.

BUACT-498 Business Accounting Field Experience (1-2 cr.)
Off-campus work and study in an approved position to better understand the challenges of being an effective manager. **R**

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BUINB Business International Business

BUINB-260 Introduction to International Business (3 cr.)
GLP Fall and Spring
Introduction to the interaction of foreign business, politics, culture, societies on basic international business systems. Basic terminology of International Business is of primary importance. Sophomore level or higher.

BUINB-338 International Logistics (3 cr.)
Spring
International logistics strategy: customer service, inventory, transportation, packaging, warehousing, storage, exporting, licensure, joint ventures, ownership documentation, terms of trading, organization, financial and management skills. Prerequisites: take BUMKG-438

BUINB-367 International Management (3 cr.)
GLP
Theory and practice of managing international organizations, including socio-cultural aspects and group dynamics of international businesses and service organizations. Prerequisites: take BUMGT-304.

BUINB-485 International Marketing (3 cr.)
GLP Fall and Spring
Principles and policies of marketing goods and services in international markets. Concepts, strategies and policies of world trade and multinational firms. Prerequisites: take BUMKG-330.

BUINB-488 International Business Practicum (3 cr.)
Fall and Spring
Assist an actual business in developing their international marketing plan. Students, under the supervision of a faculty member, determine a product's foreign marketability. Prerequisites: take BUINB-485.

BUINB-489 International Business Policies (3 cr.)
GLP Fall and Spring
Students develop the ability to solve business problems in the international arena using a scientific approach to decision making by studying business cases on international policy formulation and administration, manufacturing, marketing, finance, accounting, personnel and public relations functions. Senior level or higher. Prerequisites: Take one course from BUINB, take BUMGT-304, BUMKG-330 or BUACT-340, and take ECON-210 or ECON-201.

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BULGL Business Legal

BULGL-318 Business Law I (3 cr.)
Fall, Spring and Summer
Introduction to the nature of law, the legal system and the judicial process; also includes contracts, sales of goods and agency. Junior level or higher.

BULGL-319 Business Law II (3 cr.)
A continuation of Business Law I; includes property, secured transactions, bankruptcy, estates, commercial paper, partnerships, and corporations. Prerequisites: take BULGL-318.

BULGL-346 Seminar (1-3 cr.)
Current topics in business. (Title will reflect specific business content.) **R**

BULGL-365 Principles of Real Estate (2 cr.)
Fall and Spring
Overview of transactions in real estate, examination of the law as it relates to nature of real property, interests in real property, acquiring ownership, brokerage, real estate sales contracts, financing, land use control, and leasing and property management.

BULGL-401 Legal Environment of Business (2 cr.)
Fall and Spring
Changing relationship of government and industry: regulatory legislation, administrative agencies, national policies and social control.

BULGL-430 Real Estate Law (3 cr.)
Legal relationships involved in Real Estate law including owning, leasing, managing and selling interests in real property.
Prerequisite: take BULGL-365.

BULGL-473 Legal Aspects of Construction (3 cr.)
Fall
Analysis of contracts and documents used in building construction industry: rights of the parties. Labor relations: law and labor, legality of strikes, legality of picketing and boycott as economic pressure, unfair labor practices, employer and union, rights and responsibilities of supervisor and worker.

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BUMGT Business Management

BUMGT-100 Introduction to Business Administration (1 cr.)
Fall and Spring
Basic business systems processes, their interrelationships and role of business environment. Business Administration Program: advisement, course sequence and job opportunities. General Business Administration majors only.

BUMGT-115 Understanding Business (2 cr.)
Concepts, functions, and interrelationships of various subdivisions of service and production organizations. Equivalent to BUMGT-116.

BUMGT-116 Fundamentals of Business (3 cr.)
Summer
Fundamental exploration of contemporary business practices. Emphasis on case studies and computer simulations related to external business conditions impacting the organization.
Equivalent to BUMGT-115.

BUMGT-304 Principles of Management (3 cr.)
Fall, Spring and Summer
Basic managerial functions: planning, organizing, staffing, directing and controlling; management principles with universal applications; nature of authority and responsibility, departmentation, line and staff relations; enterprise manager in the social setting, comparative management; and management and the future.

BUMGT-346 Seminar (1-3 cr.)
Fall, Spring and Summer
Current topics in business. (Title will reflect specific business content.) **R**

BUMGT-398 Business Administration Field Experience (1-2 cr.)
Fall, Spring and Summer
Off-campus work and study in an approved position to better understand the challenges of being an effective manager. **R**

BUMGT-480 Entrepreneurship: Small Business Planning (3 cr.)
Fall and Spring
Concepts, strategies, and applications involved in entrepreneurship. Profile of entrepreneurs and the risks and rewards, creating products and services for the market place, going into business --start-up, buy out, franchise— legal and financial aspects. Preparing a business plan required.
Prerequisites: take BUMKG-330, BUACT-206 or BUACT-200.

BUMGT-489 Business and Industrial Internship(1-8 cr.)
Fall, Spring and Summer

Off-campus work and study in student's area of concentration; approved salaried position with cooperating company for a semester or summer session. Junior level or higher. **R**

BUMGT-490 Strategic Management and Business Policy (3 cr.)
Fall and Spring
Integrates previous business studies, develops ability to solve business problems through scientific approaches to decision-making. Students use business cases on policy formulation and administration: manufacturing, marketing, finance, accounting, personnel, and public relations functions. Senior level or higher. Prerequisites: Take BUMKG-330 and BUACT-340, and take ECON-210 or ECON-201.

BUMGT-498 Business Administration Field Experience (1-2 cr.)
Fall, Spring and Summer
Off-campus work and study in an approved position to better understand the challenges of being an effective manager. **R**

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BUMIS Business Management Information Systems

BUMIS-333 Management Information Systems - Decision Support Systems (3 cr.)
Fall, Spring and Summer
Improving the practice of business management through utilization of computer software based management information systems (MIS). Employs spreadsheet software as an aid to management in making, implementing and controlling decisions. Prerequisites: take BUACT-206.

BUMIS-346 Seminar (1-3 cr.)
Current topics in business. (Title will reflect specific business content.) **R**

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BUMKG Business Marketing

BUMKG-308 Marketing for Non-Profit Organizations 2 cr.
WinTerM
Strategic marketing planning process, marketing audit, marketing strategy development, positioning concept, market research, marketing mix, communication strategies and ethical issues for non-profit organizations. Sophomore level or higher. Equivalent to BUMKG-346.

BUMKG-330 Principles of Marketing 3 cr.
Fall, Spring and Summer
Retail, wholesale, advertising, channels of distribution, cooperative marketing, pricing, marketing research and marketing legislation from consumer's, middleman's and manufacturer's standpoint.

BUMKG-334 Professional Selling and Market Development 3 cr.
Fall, Spring and Summer
Overview of selling as a profession; building relationships; the selling process, including prospecting, preparing, presenting, handling objections, closing and servicing accounts,; developing markets; and territory management.
Prerequisites: take BUMKG-330.

BUMKG-335 Sales Management 3 cr.
Fall and Spring
Comprehensive survey of sales force management; organizing, staffing, and training a sales force; directing sales force operations; sales planning; and evaluating sales performance.
Prerequisites: take BUMKG-334

BUMKG-337 Procurement, Sourcing and Supply Chain Management 3 cr.
Fall and Spring
Processes used in procuring goods and services; analyzing and selecting global sources of supply; economics of total cost of ownership; importance of quality, delivery, ethics, and legal aspects of supplier management; negotiation principle. Recommended: proficiency with spreadsheet software.
Prerequisites: take BUMKG-330.

BUMKG-346 Seminar 1-3 cr.
Current topics in business marketing. (Title will reflect specific content.) **R**

BUMKG-350 E-Business Strategy and Practice 3 cr.
Fall and Spring
Development and growth of Internet marketing. An examination of e-business basics, business models, current and future trends, major issues, evaluation of model design and Internet marketing plans. Sophomore level or higher.

BUMKG-370 Principles of Advertising 3 cr.
Fall and Spring
Psychological, social and economic aspects of advertising in relationship to other aspects of distribution and its place in modern business.
Prerequisites: take BUMKG-330.

BUMKG-385 Target Marketing 3 cr.
The study and application of methods used to identify viable market segments; use of demographic, psychographic and cultural research findings to successfully market products and services to various market segments.
Prerequisites: take BUMKG-330.

BUMKG-436 Marketing Management 3 cr.
Fall and Spring
Examination of the marketing place with emphasis on unique characteristics of the marketing environment. Special emphasis on case study analysis and discussion. Advanced marketing course required.
Prerequisites: take BUMKG-330 and BUACT-207.

BUMKG-438 Principles of Logistics 3 cr.
Fall and Spring
Applies systems approach to plan movement and storage of raw materials, components and finished goods from point of origin to point of consumption. Focuses on transportation and warehousing decisions, channel structures, physical distribution, materials management, and supply chain concepts.
Prerequisites: take BUMKG-330.

BUMKG-439 Seminar: Supply Chain Systems Design 3 cr.
Spring
Synthesizing experience in supply chain, cases, problems and team/individual research will focus on analyzing, designing and modeling cost effective supply chain systems that utilize innovative technology and business practices for procuring, manufacturing, storing and moving goods from suppliers, manufacturers, distributors, retailers and end customer.
Prerequisites: take BUMK-438 and INMGT-305.

BUMKG-479 Marketing Research 3 cr.
Fall and Spring
Experimental and survey techniques to secure information for successful marketing; primary and secondary sources; data collection, compilation and analysis methods; effective communication of conclusions and recommendations to management.
Prerequisites: Take BUMKG-330; and take STAT-130, STAT-320, STAT-331, or ECON-325.

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BURTL Business Retail

BURTL-105 Introduction to Retail Merchandising and Management (1 cr.)
Fall
Exploration of origin, structure and trends in retail business. Includes industry expectations, career opportunities, curriculum and other requirements, and industry periodicals.

BURTL-127 Basic Merchandising (3 cr.)
Fall and Spring
Analyzing the retailing process, the environment within which it operates, and the institutions and functions that are performed. A foundation for students who plan to work in retailing or related disciplines.

BURTL-212 Trend Tracking and Forecasting (3 cr.)
Fall
Tracking and forecasting of product and consumer trends based on product lifecycle trends, fashion theories, socioeconomic and cultural factors, lifestyles, psychographic and demographic
trends in the marketplace.

BURTL-222 Computer Applications (2 cr.)
Microcomputer applications. Analysis of appropriate data bases. Evaluation of software. Hardware selection criteria appropriate to applications. Comparison of mainframe and microcomputer appropriate applications. Prediction of future applications. Repeatable for various subunits.

BURTL-229 Visual Merchandising (3 cr.)
Spring
Specialized study and application of merchandise/ product presentation techniques for individual displays and store designs. Interpreting basic design elements and principles for display; selecting and using of appropriate tools, fixtures, and materials; coordinating visual presentations and other promotional activities to achieve marketing objectives.

BURTL-319 International Economic Trends in Textiles and Clothing (3 cr.)
GLP Fall and Spring
Economic importance of the textile and apparel industries in the United States and the world.
Prerequisites: take APRL-140 and ECON-210.

BURTL-322 Merchandising and Marketing an Apparel Line (2 cr.)
Spring
Merchandising and marketing of product lines from manufacturer to retailer to

consumer. Prerequisites: take BURTL-227.

BURTL-327 Store Management (3 cr.)
Fall and Spring
Develop management skills for retail stores of varying size. Senior level or higher.
Prerequisites: take BURTL-430.

BURTL-329 Retail Promotions (3 cr.)
Fall
Planning and execution of all the promotional messages used to communicate with members of a target market.
Prerequisites: take BURTL-127.

BURTL-335 Special Topics in Retail Merchandising and Management (1-3 cr.)
Fall, Spring and Summer **R**

BURTL-350 Marketing to Aging and Minority Consumers (2 cr.)
Fall
Identify product and service needs of Native, African, Asian and Hispanic Americans, and aging consumers. Interpret demographic, psychological and cultural data of these special populations and develop merchandising strategies.
Prerequisites: take BUMKG-330.

BURTL-390 Merchandise Planning and Control (4 cr.)
Fall and Spring
Techniques for financial and unit planning, procurement and control of inventories for successful retail operations.
Prerequisites: take BUACT-206.

BURTL-395 Assortment Planning (3 cr.)
Fall and Spring
Methods of optimizing retail product assortments to gain a competitive advantage.
Prerequisites: BURTL-390 and APRL-202.

BURTL-398 Field Experience (1-2 cr.)
Off-campus work and study in approved position to better understand challenges and potentials of various careers in merchandising and clothing and textile industries. **R**.

BURTL-417 Social/Psychological Aspects of Clothing (3 cr.)
GLP Fall and Spring
Social and psychological influence of dress on individual and group behavior patterns.

BURTL-419 National Study Tour to Fashion Industry (1 cr.)
Fall and Spring
Five-day visit to New York or alternate city: study hours, discussions and lectures by eaders in American fashion market. Junior Level or Higher. **R**

BURTL-425 Current Retail Strategies for a Differential Advantage (2 cr.)

Fall and Spring
Comparative analysis of specific retail corporations' strategies to gain a differential advantage with their merchandising and operational methodology. Senior level or higher.
Prerequisites: take BURTL-127

BURTL-426 Fashion Retailing Practicum (4 cr.)
Fall, Spring and Summer
Observation and structured experience in merchandising procedures dealing with complete operations and management of retail establishment.
Prerequisites: take BURTL-329 and BURTL-430.

BURTL-450 Retail Practicum I (2 cr.)
Fall, Spring and Summer
Strategic planning for merchandising and operating the student-operated laboratory store to include market analysis, assortment planning, product development, merchandise procurement, promotional planning, merchandise planning, merchandise presentation and store layout.
Prerequisites: take BURTL-390.

BURTL-451 Retail Practicum II (2 cr.)
Fall, Spring and Summer
Structured experience in executing the merchandising and operation plan developed in Retail Practicum I to include evaluation of retail performance and projections for continuing operation of the student-operated retail store.
Prerequisites: take BURTL-390 and BURTL-450.

BURTL-477 Study Abroad - American Fashion College (16 cr.)
Fall
A program for selected students which offers an opportunity to study at the American Fashion College in London with the opportunity to travel in Europe. 2.5 GPA in Professional Core. Apparel Design and Development or Retail Merchandising and Management majors only.

BURTL-490 Advanced Merchandise Planning Control (3 cr.)
Fall and Spring
Application of merchandise theory and techniques to budget, manage, and adjust actual purchases, inventory, and sales of an actual retail business.
Prerequisites: take BURTL-430.

BURTL-498 Field Experience (1-2 cr.)
Off-campus work and study in approved position to better understand challenges and potentials of various careers in merchandising and clothing and textile industries. **R**

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CADD CADD/Drafting

CADD-112 Principles of Engineering Drawing 3 cr.
Drafting principles, concepts, and graphic language necessary to communicate technical information on industrial drawings through sketching, traditional drafting (TRAD) and computer (CAD) techniques.

CADD-113 Principles of Engineering Drawing II 2-3 cr.
An advanced study of drafting principles, concepts and techniques using the graphic language necessary to communicate with manufacturing personnel, floor workers, designers and engineers. Reading, research analysis and graphic solutions using sketches, traditional (TRAD) and computer (CAD) drafting are used.
Prerequisites: take CADD-112.

CADD-234 Computer-Assisted Design and Drafting 2 cr.
PC based CADD; solve problems with the assistance of computer hardware and software. Generate drawings for architectural and mechanical design applications.
Prerequisites: take CADD-112, AEC-130 or AEC-131.

CADD-395 Seminar 1-2 cr.
Title will reflect specific design, research and development content. Current and projected communication methods, concepts, technologies and innovations in design, research and development. **R**

CADD-400 Workshop 1-3 cr.
Special topics in design, research and development, providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. R

CADD-436 Computer Assisted Design Problems 2 cr.
Advanced CADD applications. Construct three dimensional wireframe drawings. Perform finite element analysis on select components. Customize software for specific applications. Customize software for specific applications. In-depth analysis of CADD applications in mechanical and architectural design. Instructor's consent required.

CADD-466 3-D Computer Modeling and Rendering 3 cr.
Development of three-dimensional computer models and computer graphic images. Includes 3-D surface modeling and rendering.
Prerequisites: take CADD-112 or CADD-234.

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CAHSS College of Arts, Humanities and Social Sciences

CAHSS-205 Scotland: Society and Globalization (3 cr.)
A wide-ranging course that explores the different aspects of contempory Scottish society. Locating Scotland in its historical and global contexts, the course focuses on many of the key social, economic, cultural and political issues that face Scotland today. In particular, it considers many of the ways that globalization can be said to be impacting on Scottish economony and society. Multi- and inter-disciplinary approach drawing on sociology, social policy, social history, and human geography. Wisconsin in Scotland exchange program students only.

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CEE Computer/Electrical Engineering

CEE-205 Circuit Analysis and Design (4 cr.)
Kirchhoff's voltage/current laws, node/loop analysis, dependent sources and operational amplifiers. Modeling ideal/real resistors/capacitors/inductors, steady state/transient behavior of RLC circuits. Sinusoids, phasors, impedance, steady state AC analysis, power factor, resonance, and frequency response. Single/three-phase power distribution and transformers. MultiSim, MATLAB, Function generators and oscilloscopes in laboratory.
Prerequisites: take MATH-154 and PHYS-282

CEE-215 Electronics (4 cr.)
Introduction to the physics/modeling of semiconductor devices such as diodes and transistors. Biasing, small/large signal circuit behavior, temperature dependence. Differential/multistage/power amplifiers. Time and frequency response of devices and circuits - including operational amplifiers. Discussion of integrated circuit fabrication technology.
Prerequisites: take CEE-205

CEE-225 Digital Logic (3 cr.)
Analysis and design of combinational and sequential logic circuits. Boolean algebra, number systems and logic gates. Realization of Boolean functions. Synchronous and asynchronous logic; counters and registers. Finite state machines, state transitions and state equivalence. Logic circuit simulation. Discrete gates and array logic laboratory experiements.
Prerequisites: take CEE-205

CEE-235 Signals and Systems (3 cr.)
Continuous-time and discrete-time signals and systems; representation and analysis of linear, time-invariant systems; differential and difference equations; convolution; Fourier, Laplace and Z-transforms; Fourier series; Time and frequency-domain analysis; Sampling theorem; Introduction to advanced signal processing topics.
Prerequisites: take CEE-205 and MATH-250

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CHEM Chemistry

CHEM-105 Visualizing Chemistry (2 cr.)
NSCI PHYSC Fall, Spring and Summer
Simple demonstrations that illustrate and reinforce understanding of the physical and chemical properties of matter. Description of the underlying chemistry and chemical safety. **$**

CHEM-107 Chemical Science and Technology (2 cr.)
TECH NSCI PHYSC
Developments in chemical sciences and how they provide key materials and principles that are utilized by other sciences, today's technology and culture.

CHEM-115 General Chemistry (5 cr.)
NSCI PHYSC LAB Fall, Spring and Summer
Fundamental principles of chemistry with applications: composition and structure of matter, formation and naming of compounds, mole concept, writing and balancing chemical equations, types of reactions, elementary stoichiometry, bonding, states of matter, equilibrium, solutions, acids and bases. Math proficiency greater than or equal to MATH-110.

CHEM-125 Principles of Chemistry For Health Sciences (5 cr.)
NSCI PHYSC LAB Fall
Principles of chemistry: general, reaction stoichiometry, equilibrium and thermodynamics. Math proficiency greater than or equal to MATH-110.

CHEM-135 College Chemistry I (5 cr.)
NSCI PHYSC LAB Fall and Spring
Principles of inorganic chemistry, properties of important elements and compounds. More rigorous approach and more extensive coverage than in CHEM-115. Normally followed by CHEM-136. Math proficiency greater than or equal to Math-120.

CHEM-136 College Chemistry II (5 cr.)
NSCI PHYSC LAB Fall and Spring
Reactions and properties of common elements and inorganic compounds; oxidation-reduction and solution equilibria; electrochemistry. Lab work in qualitative analysis for common ions.
Prerequisites: take CHEM-135, or MATH-120 and CHEM-125.

CHEM-201 Organic Chemistry I (4 cr.)
Fall and Spring
Chemistry of carbon compounds: naming, bonding, structure, physical characteristics, reactions. Compounds include hydrocarbons, aromatic compounds, alcohols, ethers, aldehydes, ketones, acids, esters, amines, amides, thiols and sulfides. Laboratory exercises on compound characteristics (physical and chemical), compound identification, reactions and reaction types.

Prerequisites: take CHEM-115 with a minimum grade C; or take CHEM-125 with a minimum grade C; or take CHEM-135.

CHEM-204 Organic Chemistry II Lecture (3 cr.)
Spring
Continuation of Organic Chemistry I; organic reactions, organic compound synthesis, reaction to mechanisms and kinetics, transition state theory, thermodynamics; introduction to IR, NMR and UV-visible spectroscopy of organic compounds.
Prerequisite: take CHEM-201.

CHEM-206 Organic Chemistry II Laboratory (1 cr.)
Spring
Systematic identification of organic compounds using chemical, physical, and instrumental methods with option for organic compound synthesis.
Prerequisite: CHEM-201.
Corequisite: CHEM-204.

CHEM-301 Physical Chemistry Lecture (3 cr.)
Fall and Spring
Fundamental physical chemistry; behavior of gases, liquid state, properties of solutions, principles of thermodynamics, thermochemistry. Taken concurrently with CHEM-303.
Prerequisites: take CHEM-115 ; or CHEM-125; or CHEM-135 and MATH-156.

CHEM-303 Physical Chemistry Laboratory (1 cr.)
Lab course to be taken concurrently with CHEM-301. Experimental techniques and apparatus; treatment of experimental data.
Prerequisites: take CHEM-115; or CHEM-125; or CHEM-135 and MATH-156.

CHEM-311 Biochemistry (4 cr.)
Fall and Spring
Fundamental chemistry and metabolism of carbohydrates, lipids and proteins; second- and third-order structure of proteins; chemistry of nucleic acids; nature and dynamics of enzymes and enzyme action; biological oxidations; lab work in metabolism, chromatography, enzyme action, qualitative and quantitative analytical procedures.
Prerequisites: take CHEM-201.

CHEM-315 Food Chemistry (3 cr.)
Spring
Organic biochemistry of foods: enzymatic and non-enzymatic changes associated with food preparation and storage (Maillard-Browning reaction), denaturation of protein, changes in color, odor, texture and nutritive value. Techniques for isolation and identification of biochemical constituents of foods.
Prerequisites: take CHEM-115, CHEM-125 or CHEM-135, and CHEM-201.

CHEM-325 Chemistry of Polymers (4 cr.)
Fall
Basic science of polymers. Common industrial polymers and their applications. Relationship of the structure and salient structural features of industrial polymers with their properties and applications.
Prerequisite: take CHEM-135.

CHEM-331 Quantitative Analysis (3 cr.)

Fall
Introduction to the principles of quantitative chemical analysis and training in precision laboratory techniques.
Prerequisites: take CHEM-136.

CHEM-335 Instrumental Methods of Analysis (3 cr.)
Spring
Application of instrumental methods to chemical analysis: electrochemical, spectrophotometric, chromatographic, and thermal analysis. Techniques for methods development, sample preparation, optimization of operating conditions, and data analysis needed to obtain accurate, reproducible results by means of instrumentation.
Prerequisites: take CHEM-331.

CHEM-341 Chemistry of Materials (4 cr.)
Fall and Spring
Relationship of the chemistry and microstructure of structural materials (metals, polymers and ceramics) to their properties; degradation of those materials, corrosion of metals, polymers and ceramics.
Prerequisites: take CHEM-115, CHEM-125 or CHEM-135.

CHEM-353 Environmental Chemistry (3 cr.)
Fall and Spring
Principles and origins of chemical reactions that lead to ecological imbalance; systems that have contributed to large-scale environmental pollution or are of current importance; chemical technology needed to correct imbalance. Prerequisites: take CHEM-115, CHEM-125 or CHEM-135.

CHEM-412 Advanced Biochemistry (3 cr.)
Fall and Spring
Structure and functionof enzymes and membrane-bound proteins, enzyme kinetics and mechanism, and regulatory mechanisms of metabolism at the molecular, cellular, and organismal levels.
Prerequisites: take CHEM-311.

CHEM-440 Advanced Materials Laboratory (1-3 cr.)
Fall and Spring
Student-devised laboratory experiments to solve a materials problem provided by the instructor. Instructor's consent required.
Prerequisites: take CHEM-115, CHEM-125 or CHEM-135. **R**

CHEM-452 Environmental Regulations Management (3 cr.)
Fall, Spring and Summer
Laws governing environmental issues. Environmental regulations, applicability of the laws, and resources for interpreting the regulations. Evaluation of environmental research.
Prerequisites: take CHEM-115 or CHEM-125 or CHEM-135.

CHEM-470 Chemistry of Materials II (3 cr.)
Fall and Spring
Advanced principles of materials: diffusion, phase transformations, corrosion kinetics and failure analysis.
Prerequisites: take CHEM-301, CHEM-341, and MATH-250 or MATH-255.

CHEM-489 Advanced Chemistry Experience (1-4 cr.)
Fall, Spring and Summer
Research experiences leading to a greater depth of understanding of chemical principles. Sophomore or higher standing and consent of instructor required.

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CSTEM College of Science, Technology, Engineering and Mathematics

CSTEM-101 Digital Electronics 3 cr.
Exploration of applied logic associated with electronic circuits and devices. Includes basic electrical principles in series and parallel circuits. Introduces fundamental logic gates and simplification techniques. Employs a case scenario based approach that includes creating and testing solutions using software and breadboard supplies. Intended for articulation with the Project Lead the Way course by the same name.

CSTEM-102 Introduction to Engineering Design 3 cr.
Exploration of the design development process. Employs a product solutions based approach that includes creating, analyzing and communicating solutions using solid modeling software. These activities and hands-on projects integrate math, science, and technology from an engineering prespective. Intended for articulation with the Project Lead the Way course by the same name.

CSTEM-103 Principles of Engineering 3 cr.
Exploration of careers in engineering and technology; introduction to technology systems and manufacturing processes. Employs activities and hands-on projects that integrate math, science and technology from an engineering problem-solving perspective. Intended for articulation with teh Project Lead the Way course by the same name.

CSTEM-104 Introduction to Computer Integrated Manufacturing 3 cr.
Applies principles of robotics and automation systems. Using CAD design, the course builds on computer solid modeling skills developed in Introduction to Engineering Design. Use of CNC equipment to produce scale models of three-dimensional CAD designs. Fundamental concepts of robotics used in automated manufacturing and design analysis are examined.

CSTEM-125 Gender and Science, Technology, Engineering and Mathematics 3 cr. GLP
Issues surrounding women and men in STEM fields; representation of women in these fields, and reasons for under-representation; global, ethnic and historical perspectives.

CSTEM-300 Introduction to Futures Study 2 cr.
Fall Semester
Methods of future projection, orienting thought toward future alternatives; impact of future problems on major areas of human activity.

CSTEM-390 Technical Service Schools .5-6 cr.
Summer Session
Some special-purpose technical courses offered by manufacturers are suitable for college credit. Guidelines: 1. Student makes all arrangements with manufacturer offering courses; 2. One credit is awarded for each full week (40 hours) of attendance; 3. Student enrolls and pays fees prior to taking course; 4. Approval of dean of College of STEM needed

before enrolling for credit; 5. Graduate School approval required for students taking course for graduate credit.

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CNS Cognitive Neurosciece

CNS-200 Introduction To Cognitive Neuroscience (3 cr.)
SBSCI NSCI PSYC LFSC
Fall, Spring and Summer
Cognitive and neural processes that support higher mental functions and methods by which inferences about the brain bases of cognition are made.

CNS-201 Introduction To Cognitive Neuroscience Lab (1 cr.)
NSCI LFSC LAB
Fall, Spring and Summer
Cognitive neuroscience experimental techniques including behavioral and electrophysiological methods of research. Measurement, analysis and presentation of laboratory data on cognitive neuroscience, such as neuronal properties, sensation, memory, perception, learning and attention.
Prerequisites or Corequisite: CNS-200.

CNS-401 Special Topics in Cognitive Neuroscience (1-4 cr.)
Topics in cognitive neuroscience of current or historical importance.
Prerequisites: take CNS-201.

CNS-480 Cognitive Neuroscience Research Experience (1 cr.)
Design, execution, analysis, and reporting of faculty-supervised, cognitive neuroscience-related research.
Prerequisite: take CNS-200, CNS-201, PSYC-391, and STAT-130 or higher.

CNS-481 Mathematics and the Brain (4 cr.)
Basic principles of computational cognitive neuroscience. Simulating cognition using biologically based networks of neuron-like units (neural networks).
Prerequisites: take MATH-120, STAT-130, CNS-200, and CNS-201.

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COUN Counseling

COUN-400 Workshop in Counseling 1-3 cr.
Current specialized topics studied through experiential activities.
Equivalent to 439-600. **R**

COUN-405 Introduction To Basic Counseling Skills 3 cr.
Fall and Spring Semesters
Develop basic helping skills including active listening; problem solving, goal setting, and decision-making; conflict resolution; information giving; assertion skills; and making referrals. Applicable when basic counseling is an appropriate helping response and also in any interpersonal relationship, including people with disability and ethnic diversity issues. Equivalent to COUN-405, 439-405, 413-405.

COUN-406 Peer Supervisory Experience 1 cr.
Fall and Spring Semesters
Experience in observation and feedback to peers undergoing counseling skill training. Instructor's consent required. **R**

COUN-447 Assessment and Treatment of Eating Disorders 2 cr.
Description and diagnostic criteria for anorexia nervosa, bulimia nervosa, obesity, and compulsive overeating. Psychological, sociological, and familial influences on the development of the disorders. Assessment instruments, approaches, and treatment considerations.

COUN-494 Counseling Older Persons 2-3 cr.
Spring Semesters
Training service providers in counseling skills and gerontology through discussion, observation and supervised counseling experiences. Equivalent to 439-694, 413-694.

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CS Computer Science

CS-141 Computer Programming – Basic (2 cr.)
ANRSN / MATH
Beginning computer programming using BASIC: input, output, flow of control, arrays, files, and subprograms.

CS-142 Computer Programming For Multimedia 1 (3 cr.)
Programming and scripting for multimedia authoring including text, graphics, sound, video, animation, graphical user interfaces, and user interaction. Scripting techniques including lists, functions, and even handlers. Multimedia packaging for CD and Web distribution.

CS-143 Computer Programming For Multimedia 2 (3 cr.)
Multimedia authoring techniques including behavior scripts, internet data access, dynamic sprite operations, and object-oriented scripting. Multimedia web techniques including design principles, site management, text, images, links, frames, sound, video, and cascading style sheets. Scripting techniques such as JavaScript, behaviors, forms, input validation, and applications.
Prerequisites: take CS-142.

CS-144 Computer Science I (3 cr.)
ANRSN / MATH
Fall and Spring
Problem-solving and algorithm development using a high-level programming language. Computer organization, programming language and programming, elements of programming style, documentation, introduction to structured programming.

CS-145 Computer Science II (3 cr.)
Fall and Spring
Problem-solving and algorithm development using a high-level language. Structured programming concepts, debugging and esting, string processing, searching and sorting, elementary data structures, recursion and files.
Prerequisites: take CS-144.

CS-244 Data Structures (4 cr.)
Fall
Concepts and foundations of data structures and algorithms. Introduction to analysis of algorithms and linear structures, vectors, linked lists, stacks, queues and priority queues. Non-linear data structures such as trees, tree traversals, binary trees, binary search trees and graphs. Advanced sorting and searching techniques. Hashing, heaps.
Prerequisites: take CS-145.

CS-245 Introduction to Computer Organization (3 cr.)
Spring
Basic concepts in computer systems including computer structure, machine language,

assembly languages, addressing techniques, macros, file I/O, program segmentation and linkage.
Prerequisites: take CS-145.

CS-248 Web and Internet Programming (3 cr.)
Fall and Spring
Design and implementation of web and internet software systems using current programming languages, scripting languages, and interface standards. Network programming and client/server applications. Support for database access via web programs.
Prerequisites: take CS-144.

CS-342 Survey of Programming Languages (3 cr.)
Spring
Programming languages and language design. Comparative study of three modern high level languages and their application strengths for systems programming, embedded computer systems and artificial intelligence.
Prerequisites: take CS-244 and CS-245.

CS-343 Mathematical Foundations of Computer Graphics (3 cr.)
Fall
Fundamental hardware, software, mathematics, data structures and algorithms for computer graphics.
Prerequisites: take CS-244, CS-245, MATH-158, MATH-275.

CS-345 Image Processing (3 cr.)
Theory and applications of digital image processing. Mathematical foundations and algorithms for enhancement, restoration, compression, segmentation and reconstruction from projections.
Prerequisites: take MATH-255, MATH-275, CS-244, STAT-332.

CS-346 Simulation Modeling and Analysis (3 cr.)
Simulation as a problem-solving technique; models, analysis and languages for simulation; data collection; random variate generation; verification and validation; output analysis; optimization of systems.
Prerequisites: take CS-244, STAT-332.

CS-441 Computer Organization (3 cr.)
Fall
Hierarchical organization of a computer system: CPU, memory, I/O modules. Detailed analysis of the CPU and control unit implementation.
Prerequisites: take CS-244, CS-245.

CS-442 Systems Programming (3 cr.)
Spring
Design, organization and case studies of major systems software: assemblers, loaders, linkers, macro processors, compilers, and operating systems. Relationship between machine architecture and system software.
Prerequisites: take CS-441.

CS-443 Database Systems Manipulation and Design (3 cr.)
Spring

Conceptual and logical organization of data, data models, data manipulation and data definition languages, and design of databases. Distributed database systems; integrity, constraints, concurrency, security, and query optimization.
Prerequisites: take CS-244.

CS-448 Software Engineering (3 cr.)
Fall
Software development lifecycle, programming languages and environments, program testing, documentation, software management and organization. Class software development project.
Prerequisites: take CS-244.

CS-458 Advanced Software Engineering (3 cr.)
Spring
Semester-long software engineering project based on an applied real life problem. Advanced models of modern software development process. An in-depth exposure to the lastest technologies and trends in software engineering: architecture, process, framework, methodologies, and tools. Software metrics, quality, management, reliability, testing, integration, verification, validation, deployment, and maintenance.
Prerequisites: take CS-448.

CS-480 Introduction to Computer Security (3 cr.)
Spring
Computer security problems and challenges, relationships between policy and security, cryptography, implementation of requirements imposed by policies, use of standards to ensure that the system will meet its goal, system vulnerabilities analysis and detection, intrusion detection, application of desired policy and procedures to support the policy.
Prerequisites: take CS-245.

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CTE Career and Technical Education

CTE-301 Preservice Workshop for Career and Technical Educators 1 cr.
Introduction to the basic concepts of teaching courses in Wisconsin career and technical education.

CTE-302 Principles of Career and Technical Education 2 cr.
Fall, Spring and Summer
Philosophy, organization and administration of career and technical education, nationwide, in Wisconsin and on the local level.

CTE-310 Foundations of Health Sciences Occupations Education 3 cr.
The philosophy, organization and administration of health science occupations education at the national, state and local level; includes current topics in health science occupations education with application for personnel in the field.

CTE-320 Careers in Health Care 3 cr.
Investigation of health care delivery system, services, occupations, and related health services, and the health sciences career clusters. Bachelor's Degree Required.

CTE-330 Curriculum Planning in Health Science Occupations 3 cr.
Competency-based and individualized approaches to principles of curriculum and course construction, study of curriculum terminology, methods of selecting and organizing content for health science occupations educators.
Prerequisites: take CTE-310 and CTE-320.

CTE-334 Performance Analysis (3 cr.)
Fall and Spring
Analysis techniques utilized in curriculum development. Emphasis on task analysis and related procedures. Includes occupational and needs analysis, competency identification, objective writing and information mapping. Integrates task analysis with a total system for developing and revising career and technical education curriculum or job training programs.

CTE-337 Competency-Based Education: Career and Technical (2 cr.)
Fall and Spring
Competencies for career, technical and adult education programs and courses. Development of competency-based education performance indicators in all domains, a competency-based education management system, and basis for competency- based education evaluation.

CTE-346 Seminar (1-3 cr.)
Fall, Spring and Summer
Current topics in career, technical and adult education with application for personnel in the

field. Instructor's consent required.

CTE-359 Technology Impacts Occupational Programs (4 cr.)
Summer
Presentation of latest technology in communications, manufacturing, construction, and/or transportation which involve concepts from math, science and computer science. **R**

CTE-360 Cooperative Occupational Education Programs (2 cr.)
Spring and Summer
Philosophy, organization, coordination and teaching techniques or cooperative education programs in the various career and technical areas. Roles, responsibilities and duties of the cooperative teacher coordinator.

CTE-375 Workshop (1-3 cr.)
Fall, Spring and Summer
Special topics providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

CTE-405 Methods of Teaching Career and Technical Education (2 cr.)
Fall and Spring
Competency-based and individualized approach to methods of teaching career and technical education.

CTE-408 Student Teaching in Career and Technical Education (4-8 cr.)
Fall, Spring and Summer
Directed teaching and community experiences at off-campus, postsecondary institutions. Consent of Program Director.

CTE-438 Course Construction for Career and Technical Educators (2 cr.)
Fall and Spring
Competency-based and individualized approach to principles of course construction for career and technical educators.

CTE-440 Instructional Evaluation in Career and Technical Education (2 cr.)
Fall and Spring
Competency-based and individualized approach to instructional evaluation for career and technical educators.

CTE-474 Adult Education (2 cr.)
Winterm
Philosophy and history of adult education in the United States. Techniques for teaching adults: psychological factors, methods, adult interests and characteristics.

CTE-488 Career and Technical Education Internship (1-8 cr.)
Fall, Spring and Summer
Consent of Program Director.

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DES Design

DES-150 Introduction to Sustainable Design and Development (2 cr.)
TECH GLP Fall and Spring
Examination of theory and practice of sustainable development and the influential role of design.

DES-200 Design Theory and Methods (3 cr.)
Fall and Spring
A study and application of various techniques and theories of design to fundamental design problems. Prerequisites: take ART-101 and ART-103.

DES-205 Presentation Techniques (3 cr.)
Fall and Spring
Experience in the various techniques of visually developing and presenting a design. Prerequisites: take ART-100.

DES-210 Letter Form Design (3 cr.)
Fall
Design of letterforms, figures, and visual symbols; history and development of type; calligraphy; page composition for various formats and audiences. Prerequisites: take ART-100 and ART-101.

DES-220 Computer Imagery (3 cr.)
Fall, Spring and Summer
Creative use of digital technology: the design of 2D images and illustrations in both hard copy and digital formats, using bitmap, vector, layout programs, and HTML editors. Corequisite courses: ART-101.

DES-231 Industrial Design Methodology, Analysis and Visualization (3 cr.)
Fall and Spring
An overview of design skills and their application to the resolution of product design problems in Industrial Design. Prerequisites: take DES-200 DES-205. Corequisite courses: DES-232.

DES-232 Human Body and Form (3 cr.)
Fall and Spring
Utilize existing human factors research methods, anthropometrics, application of data, task assessment and critical fit issues in relationship to the body as well as conduct original research while practicing industrial design.
Prerequisites: take DES-200 DES-205.

DES-256 Art Workshop(1-3 cr.)
Fall, Spring and Summer
Selected art concepts, processes and media will vary to serve special student populations. Credit determined by individual contract. **R**

DES-303 Interior Design Studio 1 (3 cr.)
Fall and Spring
Experiential study of the fundamental principles and elements of interior design and their application to a range of residential design projects. Projects emphasize residential space planning based on functional requirements, application of the various elements of design, and design communication methods.
Prerequisites: take ART-103 or BURTL-229; take DES-205, AEC-131, and AEC-233.

DES-304 Interior Design II (3 cr.)
Fall and Spring
Design problems for interior spaces with emphasis on concepts, human interaction, and materials. Prerequisites: take RD-205 or DES-303.

DES-308 Lighting Design in the Built Environment(3 cr.)
Fall
Exploration of lighting design as it affects aesthetic, color, and environmental perceptions. Ecological, practical, and qualitative aspects of lighting design.
Prerequisites: take DES-303. **$**

DES-310 Graphic Design I (3 cr.)
Fall and Spring
Study and creation of visual images used to inform and/or persuade specific audiences.
Prerequisites: take ART-101 and DES-210 or DES-330.

DES-314 Interior Specifications I (3 cr.)
Fall
An introduction to interior design methods, materials, procedures and specifications.

DES-320 Interior Furniture Design (3 cr.)
Fall and Spring
Applied studio projects with structural, material, economic and aesthetic considerations in the design of contemporary furniture.
Prerequisites: take DES-303 or DES-340.

DES-325 Multimedia Web Design (3 cr.)
Fall, Spring and Summer
Introductory exploration of the web design process for artists and designers, including creative methodologies, development, and implementation of interactive multimedia for the internet.
Prerequisites: take ART-100, ART-101, and DES-220.

DES-330 Industrial Design I (3 cr.)
Fall and Spring
First course in the industrial design sequence providing an overview of design skills in their application to the resolution of product design problems.
Prerequisites: take DES-200, DES-205, or RD-205.

DES-331 Human Interface and Interaction (3 cr.)
Fall
Developing physical and digital interfaces in product design through exploration of user-centered methods of research.

Prerequisites: take DES-232 and MFGT-110.

DES-332 Art and Science of Production (3 cr.)
Fall and Spring
The investigation and redefinition of material and production paradigms and how they impact the user's perception of the meaning and function of the object.
Prerequisites: take DES-231 and DES-232.

DES-333 Professional Practice in Industrial Design(1 cr.)
Fall and Spring
Overview of the role of the professional industrial designer.
Prerequisites: take DES-231 and DES-232. **R**

DES-340 Industrial Design II (3 cr.)
Fall and Spring
Increased understanding of design as applied to the resolution of complex product design.
Prerequisites: take DES-330.

DES-345 Product Form Design (3 cr.)
Fall, Spring and Summer
Exploration of product forms through drawing and model-building techniques.
Prerequisites: take DES-200, DES-205, DES-330, and MFGT-103.

DES-360 Graphic Design II (3 cr.)
Fall and Spring
Application of social, business and ethical factors affecting visual communication, while increasing sensitivity and experience in graphic design.
Prerequisites: take DES-310 and DES-220.

DES-370 Interface Design (3 cr.)
Fall, Spring and Summer
Design of digital interfaces using visual aesthetics and end-user research methodologies to communicate information and enhance user experience in a variety of digital output forms.
Prerequisites: take CS-143, DES-325, and DES-360.

DES-372 3D Modeling and Animation I (3 cr.)
Fall and Spring
Basic 3D modeling, rendering, and animation techniques using virtual objects and visual aesthetics to define form and motion.
Prerequisites: take ART-103, ART-200 and DES-376.

DES-373 Digital Characters (3 cr.)
Fall and Spring
Study of 3D modeling and animation of digital characters and "artificial" life forms.
Prerequisites: take DES-372 and ART-301.

DES-374 3D Modeling and Animation II (3 cr.)
Fall and Spring
Intermediate to advanced level 3D modeling, rendering, and animation techniques using virtual objects and visual aesthetics to define form and motion.
Prerequisites: take DES-372. **R**

DES-376 Digital Narrative One: Animation and Video for Multimedia (3 cr.)
Fall and Spring
An introduction to the conception, design and creative implementation of animation and digital video for developing time-based narratives utilizing digital multimedia tools.
Prerequisites: take DES-220, DES-310, and MEDIA-430.

DES-377 Interactive Digital Content Design (3 cr.)
Fall and Spring
Exploration of emerging forms of interactive digital content through advanced multimedia design topic(s).
Prerequisites: take DES-370.

DES-380 Signage and Exhibition Design (3 cr.)
Summer
Organization and design of environmental graphics through the production of signage, display, and exhibition support systems.
Prerequisites: take DES-205 and DES-360.

DES-381 Advanced Computer Animation (3 cr.)
Fall and Spring
Advanced 3D modeling, rendering and animation techniques where student develop personal aesthetics and character forms.
Prerequisites: take DES-372.

DES-382 Information Design (3 cr.)
Fall and Spring
Envisioning information through the design and production of charts, diagrams, maps, and other hierarchical graphics.
Prerequisites: take DES-360.

DES-384 Advertising Design (3 cr.)
Fall and Spring
Graphic design principles and creative concepts as applied to advertising art.
Prerequisites: take DES-205 and DES-360.

DES-385 Interactive Design (3 cr.)
Fall and Spring
Advanced design of digital interfaces and interactive systems focusing on visual aesthetics in a variety of output forms with various electronic devices.
Prerequisites: take DES-370.

DES-386 Publication Design (3 cr.)
Fall and Spring
Graphic design principles as applied to the combination and coordination of art and typography with text.
Prerequisites: take DES-360.

DES-388 Typographic Design (3 cr.)
Fall and Spring
Design of grid-based, hierarchical and expressive typographic structures; analysis of historical and theoretical precedents.
Prerequisites: take DES-360.

DES-389 Typography in Motion (3 cr.)
Fall and Spring
Introduction into dynamic, time based typography covering technology and skills involved in creating kinetic and emotive typography with various media.
Prerequisites: take DES-325 and DES-360.

DES-405 Advanced Presentation Techniques for Designers (3 cr.)
Fall and Spring
Techniques and skills for presentation and communication of visual materials; advanced perspective, mixed-media rendering, transparent watercolor rendering, gouache rendering applied to presentation of product's interiors and exteriors.
Prerequisites: take DES-205.

DES-410 Product and Packaging Graphics (3 cr.)
Design and application of graphics to products, packages, and related display systems.
Prerequisites: take DES-360.

DES-414 Interior Specifications II (3 cr.)
Spring and Summer
Advanced interior design specification and construction documentation, incorporating elements of current professional practice.
Prerequisites: take DES-314.

DES-415 Interior Design Studio 3 (3 cr.)
Advanced experiential study of the principles and elements of interior design and their application to a range of commercial design projects. Studio design projects emphasize conceptual development, space planning, building code and accessibility compliance.
Prerequisites: take DES-304.

DES-416 Interior Design Senior Studio (4 cr.)
Advanced interior design topics, with extensive projects, including all phases of current interior design professional practice and incorporation into student portfolio.
Prerequisites: take DES-308 and DES-414.

DES-430 Industrial Design III (4 cr.)
Fall and Spring
Advanced design problems chosen by consultation between student and instructor.
Prerequisites: take DES-345 and DES-340.

DES-431 System, Environment and Context (3 cr.)
Fall
Advanced industrial design problems researching system design with consideration of contextual and environmental issues.
Prerequisites: take DES-331.

DES-432 Theory, Society and Application (3 cr.)
Fall and Spring
Advanced design problems applying the theory of design to societal issues.
Prerequisites: take DES-331 and DES-332.

DES-440 Industrial Design IV (4 cr.)

Fall and Spring
Professional level of understanding and skill applied to advanced design problem chosen in consultation between student and instructor.
Prerequisites: take DES-430.

DES-451 Interior Design Practicum (3 cr.)
Fall and Spring
Work experience with an interior designer or in design-related field arranged with interior design work experience coordinator.
Prerequisites: take DES-303.

DES-456 Advanced Art Workshop (1-3 cr.)
Selected art concepts, processes and media will vary to serve special student populations. For students familiar with workshop approach or advanced in art program. Credit determined by individual contract. **R**

DES-480 Senior Project -- Graphic Design (4 cr.)
Exploration of an advanced graphic design topic through an extensive project: research, production specification, and development of a presentation system. Instructor's consent required. Prerequisites: take either DES-360 and DES-380 or take DES-360 and DES-410.

DES-490 Senior Project Multimedia Design (4 cr.)
Fall and Spring
Approved advanced Multimedia topic(s) explored through the completion of professional level project(s), from concept to published digital media. Multimedia Design students only.
Prerequisites: take DES-370 and MEDIA-430 and take DES-384 or DES-385.

DES-497 Field Experience (1-2 cr.)

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ECE Early Childhood Education

ECE-100 Introduction to Early Childhood Programs (1 cr.)
Fall and Spring
History of early childhood programs for children through age 8, developmentally appropriate practice, current issues, professionalism, employability skills and attitudes, career exploration. Early Childhood majors only.

ECE-303 Developmentally Appropriate Practice: Infants and Toddlers (3 cr.)
Fall
Developmentally appropriate practices for teaching with infants and toddlers in group settings. Contrast of appropriate and inappropriate practices. Emphasis on play, creativity, health
and safety, integrated curriculum, appropriate teaching strategies, assessment, program models, and writing lesson plans for infants and toddlers. Observations required.
Prerequisites: take HDFS-124.

ECE-307 Developmentally Appropriate Practice: Preschool (4 cr.)
Fall and Spring
Developmentally appropriate teaching practices with preschool children in group settings. Play, creativity, health and safety, integrated curriculum, teaching strategies, assessment, program models and lesson plans. Observations and practicum required. Education Majors: Benchmark I completed.
Prerequisites: take HDFS-124.

ECE-309 Developmentally Appropriate Practice: Kindergarten -- Primary (2 cr.)
Fall and Spring
Developmentally appropriate teaching practices in kindergarten through grade 3 in group settings. Play, creativity, health and safety, integrated curriculum, teaching strategies, assessment, program models and lesson plans. Observations required. Education Majors: Benchmark I completed. Prerequisites: take HDFS-124.

ECE-364 Observing and Guiding Children: Early Childhood Classrooms (3 cr.)
Fall and Spring
Essential elements in guiding children in early childhood classrooms. Positive guidance strategies, introduction to early childhood classroom management, effects of guidance on children's social and emotional development, developing an eclectic approach. Power, process, ethics, methods of observing, documenting children's behavior, progress, development. Observation and participation in early childhood classrooms required. Minimum cumulative grade point average 2.75. Education majors must have passed PPST.
Prerequisites: take PSYC-110, HDFS-124, and ECE-303.

ECE-410 Early Childhood Curriculum: Science (3 cr.)
Fall and Spring
Methods and materials for assessing, planning, implementing and evaluating science curricula for early childhood (birth-grade 3). Emphasis on science process skills while

fostering foundational knowledge in all science areas. Education Majors: Benchmark I completed.
Prerequisites: take ECE-303 and ECE-307 and ECE-309.

ECE-411 Early Childhood Curriculum: Mathematics (3 cr.)
Fall and Spring
Mathematics curriculum planning for early childhood (birth through 3rd grade), including selection, organization, presentation, and evaluation of appropriate curricula. Education Majors: Benchmark I completed.
Prerequisites: take ECE-303 and ECE-307.

ECE-412 Early Childhood Curriculum: Social Studies (3 cr.)
Fall and Spring
Methods and materials for assessing, planning, implementing and evaluating social studies curriculum for early childhood (birth-3rd grade). Education Majors: Benchmark I completed.
Prerequisites: take ECE-303 and ECE-307 and ECE-309.

ECE-413 Language Arts and Emergent Reading I: Birth-Kindergarten (3 cr.)
Fall, Spring and Summer
Developmentally appropriate strategies and materials for planning, implementing, and evaluating language arts. Emphasis on developing emergent literacy skills and language arts with children Birth through Kindergarten. Education Majors: Benchmark I completed.
Prerequisites: take ECE-303.

ECE-414 Early Childhood Clinical Experience: Integrated Curriculum (2 cr.)
Fall and Spring
Development of competencies in planning, teaching, and evaluating the integrated curriculum for the early childhood period. Participation in an early childhood setting required. Education Majors: Benchmark I completed.

ECE-421 Administration of Early Childhood Programs (2 cr.)
Fall
A study of program organization, program design, staffing, licensing, certification, equipment and facilities for operating early childhood education programs. Field trips required.

ECE-426 Advanced Classroom Management and Guidance (3 cr.)
Fall and Spring
Advanced study of managing early childhood classrooms. Management of the physical environment, instructional context, including large and small groups, and social context. Building a classroom community and encouraging collaborative learning. Assessing management of early childhood classrooms. Analysis of classroom management programs. Observation/participation in early childhood classrooms required.
Prerequisites: take ECE-364.

ECE-427 Child Abuse and Neglect (2 cr.)
Fall
Systemic nature, forms and indicators, and prevention of abuse/neglect. Factors contributing to, and intervention skills in, coping with the effects of abuse/neglect on children and families at risk.

ECE-433 Language Arts/Reading -- Early Childhood Education (3 cr.)
Fall and Spring
Current philosophies, methodology and materials for teaching reading: readiness activities and beginning reading in early childhood.

ECE-435 Children, Families, Schools and Communities (3 cr.)
Fall, Spring and Summer
Building family, school, and community partnerships to support children's well being and educational success. Theories and processes used to establish positive home-school-community
relations.

ECE-464 Special Topics in Early Childhood Curriculum(1-3 cr.)
Philosophy and methodology of early childhood education: problems confronting teachers.
R

ECE-480 Student Teaching: Infant, Toddler, Preschool (4-8 cr.)
Fall and Spring
Full-day student teaching in a school setting for one quarter, based on the university calendar, with infants, toddlers, or preschoolers. Includes parent interaction and seminar sessions. Professional program admission required.

ECE-480A Student Teaching in Preschool Programs (4 cr.)
Fall and Spring
Directed teaching and community experience in selected early childhood centers.

ECE-480B Student Teaching in Kindergarten (4 cr.)
Fall and Spring
Directed teaching and community experience in selected kindergartens.

ECE-488 Intern Teaching (8-16 cr.)
An alternate method of obtaining student teaching experience. Teacher interns receive license to teach and salaried appointments in cooperating school systems for one full semester.

ECE-492 Student Teaching in Prekindergarten (8 cr.)
Fall, Spring and Summer
Full-day student teaching experience at the prekindergarten level in a preschool setting, together with a weekly one-hour student teaching seminar session. The student teaching experience follows the calendar of the preschool. Not available to students who have taken ECE-480A and/or 212-490. Early Childhood majors only. School of Education permission required.
Prerequisites: take HDFS-335 and HDFS-344 and ECE-433.

ECE-493 Student Teaching: Kindergarten (4-8 cr.)
Fall and Spring
Full-day student teaching in a school setting for one quarter based on the host school's calendar with kindergarten age children. Includes parent interaction and seminar sessions. Professional program admission required.

ECE-494 Student Teaching: Primary (4-8 cr.)
Fall and Spring

Full-day student teaching in a school setting for one quarter based on the host school's calendar in grade 1, 2 or 3. Includes parent interaction and seminar sessions. Professional program admission required.

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ECON Economics

ECON-201 General Economics 3 cr.
SBSCI ECON Fall and Spring Semesters
Introduction to basic elements of economics; analysis of institutions, issues and policy; theories of price, national income and employment. Not open to students taking ECON-210 and ECON-215.

ECON-210 Principles of Economics I 3 cr.
SBSCI ECON Fall, Spring and Summer
Tools of basic economic analysis including scarcity, cost, and demand and supply; macroecon- omic issues such as economic growth, inflation, and unemployment; alternative macroeconomic theories; and fiscal and monetary policies.

ECON-215 Principles of Economics II 3 cr.
SBSCI ECON Fall, Spring and Summer
Theory of individual economic behavior; price determination; market structures; labor, capital and natural resource markets; international economics; and current microeconomic topics.
P: ECON-210.

ECON-335 Personal Investing 3 cr.
Terminology, evaluation, selection and risk analysis of all types of investment vehicles: stocks, bonds, mutual funds, and enhanced traded funds. P: ECON-201 or ECON-210.

ECON-350 Environmental and Natural Resources Economics 3 cr.
Principles underlying use of natural resources including demand and supply; efficiency; cost effectiveness and benefit-cost analysis; sustainability; optimal pricing; and management of renewable and non-renewable resources. Principles are applied to the examination of pollution control, preservation vs. development, recycling, and other environmental and natural resources issues and policies.
P: Take ECON-201 or ECON-210

ECON-380 Economic and Business Forecasting 3 cr.
Quantitative methods used in economics and business forecasting. Topics covered include: descriptive statistics, hypothesis testing, correlation, regression analysis and forecasting. Real business applications of these techniques are emphasized.
P: Take ECON-201 or ECON-215, and take ECON-325 or STAT-130 or STAT-320.

ECON-410 Microeconomics 3 cr.
Fall and Spring Semesters
Value and distribution theory; analysis of demand-firm, industry and utility; pricing of production factors.
P: ECON-215.

ECON-415 Macroeconomics 3 cr.
Fall and Spring Semesters
Determination of aggregate income, employment, growth rates and price levels; monetary and fiscal policies necessary for full employment.
P: ECON-215.

ECON-420 Labor Economics 3 cr.
Fall, Spring and Summer
Basic labor theory; history of organized labor in western industrial societies; collective bargaining as viewed by labor, management, government and public; institutions involved in modern labor relations.
P: ECON-201 or ECON-210.

ECON-421 Collective Bargaining and Labor Relations Relations 2 cr.
Fall, Spring and Summer
Introduction to collective bargaining in the U.S.; formation, substance and administration of a labor agreement, current labor law, role of National Labor Relations Board.
P: ECON-201 or ECON-210.

ECON-425 Economic Development 3 cr.
GLP
Analysis of the economies of less developed countries in an institutional and international framework to understand the social and economic realitites of people living in these regions. Evaluation of economic policies and their impact on development.
P: ECON-215

ECON-435 Money, Banking, Financial Markets 3 cr.
Fall and Spring Semesters
Money and bank credit, modern monetary theories, monetary policy.
P: ECON-201 or ECON-210.

ECON-445 Public Finance 3 cr.
Spring Semester
Public finance at all governmental levels; taxation, expenditures, debt management and fiscal policy.
P: ECON-201 or ECON-210.

ECON-480 International Economics 3 cr.
Fall and Spring Semesters
Survey of current issues such as changing world financial situations, international agreements and organizations, and other topics related to trade models, tariffs, exchange rates and balance of payments.
P: ECON-210.

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EDUC Education

EDUC-010 Praxis I: Pre-Professional Skills Test Writing Preparation 1 cr.
Designed to prepare education students for the PPST: Writing Test. Structured writing format and learning strategies to develop an organized and authoritative approach to professional writing.

EDUC-170 Video Games and Simulations in Educational Environments 2 cr.
Philosophical, theoretical, design and implementation issues relative to incorporating games and simulations within educational and training environments. Emphasis will be placed on education environments.

EDUC-210 Impacts of Technology on Learning 2 cr.
TECH
Fall, Spring and Summer
The impacts of technology on the education of the individual and society; the role technology plays in both the informal and formal education of individuals; contemporary developments and issues related to the use of technology in the learning process.

EDUC-303 Educational Psychology 3 cr.
Introduction to the psychological aspects of the educative processes. Emphasis on application of basic psychological principles to teaching. Focus on learner, learning process, and the teacher as an agent for change. Benchmark I completed. Prerequisites: take PSYC-110.

EDUC-304 Secondary Curriculum Methods and Assessment 2 cr.
Discipline-specific curriculum, methods, and assessment procedures for teaching content minors. Benchmark I completed.
EDUC-305 Teaching Practicum 2-16 cr.
Fall, Spring and Summer
Directed teaching in school setting in subject area consistent with teaching minor or add-on certification. Completion of teacher work sample or portfolio. Benchmark II completed.

EDUC-307 Applied Human Relations 2 cr.
ESC
Fall, Spring and Summer
An experiential course focusing on major themes affecting human relations.

EDUC-310 Field Experience – Tutoring 1 cr.
Supervised one-on-one or small group teaching experience in a school or other educational setting in response to the special needs of students with learning difficulties. Emphasis is on precision teaching, individualized instruction, and alternative strategies. Benchmark I completed.

EDUC-312 Introduction to Curriculum, Methods, and Assessment 2 cr.
Fall and Spring
Principles and practices of curriculum development, instructional methods, and measures

of assessment of learning; including issues of and approaches to curriculum and curriculum development; methods of effective teaching; purposes, methods, and measures of assessment. Minimum Cum GPA 2.75. Educ Mj must have passed PPST.

EDUC-326 Foundations of Education 2 cr.
The study of education and schooling through philosophical, historical, sociological and curricular contexts.

EDUC-336 Multiculturalism: Issues and Perspectives 2 cr.
ESA
Intensive study of diversity in U.S. schools. Examination of the educational needs of students from various ethnic, cultural, religious, language and social class groups. Discussion of issues related to racism, sexism and oppression.

EDUC-376 Cross-Cultural Field Experience 1 cr.
Supervised field experience in an educational setting with diverse learners to increase awareness, understanding, sensitivity, and appreciation for ethnic and cultural diversity. The acquisition of knowledge, skills, and professional dispositions necessary for educators to facilitate learning for all students are emphasized. Benchmark I completed.

EDUC-380 Reading and Language Arts in Elementary Education 3 cr.
Current philosophies in reading and language arts education, the centrality of language arts to the elementary curriculum and methodologies for the elementary classroom. Benchmark I completed.

EDUC-381 Preclinical: Elementary Education Language Arts and Reading 1 cr.
Supervised teaching experience in developing the prospective teacher's ability in elementary education language arts and reading skills. Benchmark I completed.

EDUC-382 Secondary Reading and Language Development 2 cr.
Effective utilization of reading and language development methodologies in secondary content area classrooms. Benchmark I completed. Prerequisites: take EDUC-303.

EDUC-400 Workshop: Special Topics in Education1-3 cr. R

EDUC-401 Global Education Practicum 3 cr.
GLP
Summer
Experiential learning opportunity to provide student with in-depth study of one or more of the global education sub-groups: human rights and social justice, human commonality and diversity, population demographics, planet management, global belief systems, economic systems, conflict and control, political systems, science and technology and/or sustainable development.

EDUC-402 Global Perspectives for Educators 3 cr.
GLP
Fall and Spring
Strategies for infusing global perspectives into the classroom for those working in globalized organizations. Methodology, materials and instructional strategies necessary for effective implementation of global education in schools and individual classrooms as well as within global organizations. Topics/issues related to globalization to develop a foundation from which teachers and other leaders in organizations can draw ideas for their

specific needs.

EDUC-403 Educational Psychology of the Adult Learner 2 cr.
Spring and Summer
Psychological principles and theoretical framework guiding the educational process for adult learners. Special focus on planning and evaluating instruction while utilizing active learning to build strong learning communities.

EDUC-415 Classroom Management 2-3 cr.
Technique and theory for motivating Pre-K through grade 12 age students to manage their own behaviors, including preventive discipline, behavior management, classroom environment, classroom climate, effective communication, conflict resolution, and peer mediation. Must be taken concurrently with variety of field experiences. Benchmark I completed.

EDUC-416 Conflict Resolution and Crisis Management for Educators 2 cr.
Conflict mediation and crisis intervention strategies in school settings.

EDUC-430 Ojibwe Lifeways 2-4 cr.
ESA Summer
Indepth, interactive study of Ojibwe culture within a Wisconsin reservation community. **$**

EDUC-495 Personal Learning Experience 2 cr.
An experimental program for juniors and seniors. By permission of program directors. Each student selects an area of life which involves ethical decision and investigates that decision-making process. The group enrolled for this experience meets with the directors twice a week for direction, discussion, and criticism. Self-evaluation paper at the close of the course, which is submitted to the critique of the directors and other members of the learning experience.

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ELEC Electricity/Electronics

ELEC-204 Electricity/Electronics Fundamentals 3 cr.
Electricity/electronics, associated phenomena related to basic electrical and electronics systems. Examines devices, operation, application, theory from power devices to electronic devices, controls to microprocessors.
Prerequisites: take MATH-120.

ELEC-260 Electrical Circuits 3 cr.
Concepts and analysis techniques in DC and AC circuit analysis including current, voltage, resistance, capacitance, inductance, impedance, loop and node equations, transients, network theorems, real, reactive and apparent power in AC circuits.
Prerequisites: take PHYS-211 and MATH-153.

ELEC-271 Digital Logic and Switching 3 cr.
Analysis and synthesis of combinational and sequential switching circuits. Boolean algebra and number systems, switching functions, minimization, single and multiple output networks, realization of functions, programmable logic devices. Finite state sequential machines, state transition diagrams, machines and state equivalence. Algorithmic state machines and asynchronous state machines.
Prerequisites: take ELEC-204 or ELEC-260.

ELEC-272 Solid State Electronics 3 cr.
Basic semiconductor theory dealing with signals, operational amplifiers, diodes, bipolar junction and field effect transistor, frequency response, feedback, and circuit analysis.

ELEC-274 Fundamentals of Microprocessors and Microcomputer Systems 3 cr.
Concepts of microprocessors, microcomputer architecture, assembly language programming and peripheral components. Hardware topics include 80 x 86 processors, interrupts, bios, serial and parallel interfaces, video displays, hard drives, CD ROMS, memory devices and local and peripheral buses.
Prerequisites: take ELEC-271 and CS-144.

ELEC-290 Circuits and Devices 4 cr.
Electrical and electronic circuits and devices. Analysis of circuits containing passive and active components. Analog and digital circuitry including amplifiers and logic gates. Power calculations in alternating current circuits. Electro-mechanical energy conversion including DC and AC machinery. Lab activities include use of base test equipment and the construction of simple electronic circuits. Prerequisites: take MATH-154 and PHYS-282.

ELEC-303 Electronics Circuits, Devices and Applications 3cr.
Concepts and analysis techniques in DC and AC circuit analysis, basic electronics theory, devices, logic and systems, including capacitance, inductance, impedance, circuit equations, network theorems, signals, op-amps, transistors, and circuit analysis. Number systems, combinational logic, minimization, programmable logic devices, state machine algorithms, transition diagrams, asynchronous and synchronous sequential logic.

Prerequisites: take MATH-153 and PHYS-242.

ELEC-310 Biomedical Instrumentation 3cr.
Review of basic electronics; measurements of physical, chemical, biological, and physiological variables; safety, noice, isolation, grounding, and shielding in biomedical instrumentation; circulatory, nervous, respiratory systems and related instrumentation; introduction to clinical lab systems; introduction to medical imaging systems.
Prerequisites: take ELEC-204.

ELEC-340 Motors and Generators 2 cr.
Practical approach to basic operating theory, construction, maintenance of generators, motors, transformers, and machine control.
Prerequisites: take ELEC-204.

ELEC-341 Electrical and Mechanical Interface Devices 3 cr.
Introduction to control system technology of discrete processes with emphasis on the devises that interface between electrical and mechanical systems. Theory and applications of sensors, actuators, schematics, state charts, ladder diagrams, programmable logic controllers, and PC based data acquisition and control.
Prerequisites: take ELEC-204 or ELEC-260 and take PHYS-241 and POWER-260.

ELEC-382 Electronic Communications 4 cr.
Electrical/electronic communication systems, modulation, demodulation, R.F. and I.F. amplifiers, alignment, antennas, composite TV signal, receivers, transmitters, spectral representation of signals, amplitude modulation, AM/FM transmitters, side band transmission, AM/FM receivers, and frequency modulation.
Prerequisites: take ELEC-204.

ELEC-395 Seminar 1-2 cr.
Specific content is designed to upgrade competencies of participants. Content will change to reflect current state of the art in electricity/electronics or power mechanics. **R**

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ENGGR Engineering Graphics

ENGGR-112 Principles of Engineering Drawing 3 cr.
Drafting principles, concepts, and graphic language necessary to communicate technical information on industrial drawings through sketching, traditional drafting (TRAD) and computer (CAD) techniques.

ENGGR-210 Engineering Graphics Using Solid Modeling 3 cr.
Engineering graphics principles and standards, development of effective technical communication skills between design, engineering, and manufacturing disciplines. Project planning, solid modeling, assembly composition and drafting techniques to support and solve engineering and design problems.
Prerequisites: take ENGGR-112.

ENGGR- 234 Computer-Assisted Design and Drafting 2 cr.
PC based CADD; solve problems with the assistance of computer hardware and software. Generate drawings for architectural and mechanical design applications.
Prerequisites: take ENGGR-112, AEC-130 or AEC-131.

ENGGR-266 3-D Computer Modeling and Rendering 3 cr.
Development of three-dimensional computer models and computer graphic images. Includes 3-D surface modeling and rendering.
Prerequisites: take ENGGR-112 or ENGGR-234.

ENGGR-280 Engineering Graphics Applications 3 cr.
Contemporary software and hardware used to produce solutions for engineering design problems. Topics include comprehensive graphic standards and implementation, advanced methods of producing engineering graphics, tools for improving design efficiency, and alternative communication technologies.
Prerequisites: take ENGGR-210.

ENGGR-395 Seminar 1-2 cr.
Title will reflect specific design, research and development content. Current and projected communication methods, concepts, technologies and innovations in design, research and development. **R**

ENGGR-400 Workshop 1-3 cr.
Special topics in design, research and development, providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. R

ENGGR-436 Computer Assisted Design Problems 2 cr.
Advanced CADD applications. Construct three dimensional wireframe drawings. Perform finite element analysis on select components. Customize software for specific applications. Customize software for specific applications. In-depth analysis of CADD applications in mechanical and architectural design. Instructor's consent required.

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ENGL English

ENGL-090 Writing Workshop (3 cr.)
This is a remedial writing course that provides individual instruction to meet basic competencies for entry into English 101. Students will write paragraphs and short essays that will prepare them for college-level writing. They will also be given instruction in grammar, usage, punctuation and mechanics. Students must receive a C or better in this course in order to register for English 101. Although this course does not count toward graduation, it is included in the student's course load, fees, and grade point average.

ENGL-101 Freshman English – Composition (3 cr.)
COMSK/WRIT
Fall, Spring and Summer
Principles and practices of writing; documented paper. Placement Test Required.

ENGL-102 Freshman English – Reading and Related Writing (3 cr.)
COMSK/RDG
Fall, Spring and Summer
Readings focused on a theme reflected in literature. Topics and approaches developed by each instructor; opportunity for responsible, independent study; requires intensive practice in composition.
Prerequisites: take ENGL-101 or ENGL-111.

ENGL-111 Freshman English – Honors I (3 cr.)
COMSK/WRIT
Fall and Spring
Readings in world literature and related writing for training in composition techniques; documented paper. Placement Test Required.

ENGL-112 Freshman English – Honors II (3 cr.)
COMSK/RDG
Fall and Spring
Continuation of ENGL-111.
Prerequisites: take ENGL-101 or ENGL-111.

ENGL-113 Honors Seminar I (3 cr.)
COMSK/WRIT
Fall and Spring
Intensive reading and writing that examines topics in world literature from Shakespeare to the present.
Prerequisites: take ENGL-101 or ENGL-111.

ENGL-121 Introduction To Technical Communication (3 cr.)
Fall
Trends, opportunities, and technologies used in technical communication. Rhetorical dimensions of technical documentation as well as ethical and social responsibilities.

ENGL-125 Professional Writing Elements of Style (3 cr.)
Spring
Develop stylistic fluency through study of interaction of rhetoric, style, and grammar. May not be substituted for any required English composition course. Prerequisites: take ENGL-101 or ENGL-111.

ENGL-207 Writing For the Media (3 cr.)
Fall
Theory and practice of writing for the media.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-210 Journalism Practicum(1 cr.)
Fall and Spring
Work on regularly published newspaper and submit articles for evaluation and publication.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113. **R**

ENGL-218 Mass Communication: Effects of the Technology On Society (3 cr.)
TECH
Spring
The ideological and social implications of mass communication technology.
Prerequisites: take ENGL-101 or ENGL-111.

ENGL-225 Editing Processes and Practices (3 cr.)
Spring
Comprehensive editing, copy editing, proofreading, and style selection; review of standard written English grammar and usage.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113; and take ENGL-125.

ENGL-245 Creative Writing (3 cr.)
HUM/CRPRF
Fall and Spring
All aspects of imaginative writing. Prerequisites: take ENGL-102, ENGL-112 or ENGL-113. **R**

ENGL-247 Critical Writing (3 cr.)
COMSK/WRIT
Fall, Spring, and Summer
The art of evaluation and judgment; writing critical reviews and articles; documented critical paper.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-312 International Technical Communication (3 cr.)
Spring
Theories and practical approaches to writing international technical documents, including globalization, localization, and translation preparations and procedures. Extensive use of case studies and cultural models. Scholarship in international technical communication and its relevance to workplace practice will be evaluated.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

ENGL-317 Topics in Journalism (1-3 cr.)
Intensive study of and practice in topics in journalism.
Prerequisites: take ENGL-102,ENGL-112 or ENGL-113.

ENGL-320 Business Writing (3 cr.)
Fall and Spring
Written communication in business: practice in writing memos, letters, electronic correspondence, reports and other practical communication.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-330 Feature Writing (3 cr.)
Fall and Spring
Plan, research and create feature articles for newspapers, magazines and online publications; develop research tools and writing skills; observe ethical and legal considerations in writing.
Prerequisites: take ENGL-207.

ENGL-335 Critical Approaches to Digital Humanities (3 cr.)
Fall
Explores the rhetoric of technologies and the dynamic interaction between digital technologies and society.

ENGL-340 The Structure of English (3 cr.)
Fall
New analytic and descriptive methods applied to modern English.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-342 Creative Writing II (3 cr.)
Advanced practice in creative writing that builds on skills taught in ENGL-245 Creative Writing, focusing on genre specific texts.
Prerequisites: take ENGL-245.

ENGL-343 Rhetoric of Technology (3 cr.)
TECH
Fall and Spring
Study of the way in which published information influences the development and dissemination of technology.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-361 Hypertext Writing (3 cr.)
Fall and Spring
Investigate writer and audience interaction in a hypertext environment. Gain exposure to and utilize markup languages to maximize audience participation in websites and other hypertext documents. Research, production and testing of an original website and hypertext essays.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-371 Rhetoric and Style: Strategies of Argumentation (3 cr.)
Spring
This course examines classical rhetoric to identify its enduring elements and concerns as well as its critical tensions and conflicts. Students will obtain the vocabulary and conceptual understanding of the rhetorical tradition with attention to developing both oral and written arguments.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-385 Document Design (3 cr.)

Fall
Approaches to transmitting information in print and screen documents through the application of rhetorical and design principles. Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

ENGL-388 Writing for the Internet (3 cr.)
Fall
Investigate writer and audience interaction in hypertext and multimedia environments, and gain exposure to and utilize markup languages to maximize audience participation. Research, produce, and test an original hypertext or multimedia artifact.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-407 Seminar in Applied Journalism (3 cr.)
Spring
Investigation into journalistic practices in particular disciplines, industries, and trades. Students will research, synthesize, and apply journalistic practices to their chosen field.
Prerequisites: take ENGL-207.

ENGL-415 Technical Writing (3 cr.)
Fall, Spring and Summer
On-the-job writing for business and industry; reports, letters and other documents.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

ENGL-425 Usability Design and Testing (3 cr.)
Spring
Plan, design, and conduct tests, measure effectiveness and efficiency of written and online documents; examine methodology and application of usability testing to demonstrate its value and importance. Prerequisites: take ENGL-415.

ENGL-430 Writing For Content Management (3 cr.)
Fall
Concepts and practices of content management systems for the creation and production of technical communication both in print and online. Includes document workflow, globalization and translation of content for assembly of relevant documents. Uses case studies and client-based projects. Prerequisites: take ENGL-415.

ENGL-435 Writing Technical Manuals (3 cr.)
Spring
Production of a technical manual — planning procedure, collecting information, analyzing audience, writing and field testing.
Prerequisites: take ENGL-415.

ENGL-437 Technical Writing Practicum (1-3 cr.)
Arranged
Plan, write and produce a technical document for a client. Principles of document design, clear writing for a specific audience, methods of determining client needs, and methods of producing the final document. Prerequisites: take ENGL-415. **R**

ENGL-438 Writing Practicum For Early Childhood Education (1 cr.)
Creation of professional letters, newsletters, and other written documents for future early childhood educators. Early Childhood majors only.
Prerequisites: take ENGL-102, ENGL-112or ENGL-113.

ENGL-440 Writer At Work Seminar (2 cr.)
Summer
Introduction to and practice in the professional side of creative writing, including but not limited to publication, reading, writers conferences and grant writing. Instructor's consent required.
Prerequisites: take ENGL-342.

ENGL-471 Technical Communication and Consulting (3 cr.)
Spring
Working for clients, setting rates and estimating costs, investigating and contacting markets, contacting and interacting with editors, handling taxes and insurance, copyright, intellectual property, job search for freelance or corporate jobs. Practical networking; global dimensions of and new trends in technical communication.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

ENGL-480 Seminar in Digital Humanities (3 cr.)
Spring
Research into and discussion of current and emerging issues in the digital humanities. Subject matter covered will vary to reflect the state of current research.
Prerequisites: take ENGL-335.

ENGL-495 Digital Humanities Capstone (3 cr.)
Fall and Spring
Development of student-initiated research project in the Digital Humanities over two semesters. Results in thesis in medium appropriate to topic.
Prerequisites: take ENGL-335. **R**

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FCSE Family and Consumer Sciences Education

FCSE-101 Introduction to Family and Consumer Sciences Education (1 cr.)
Fall
Contribution of Family and Consumer Sciences to development of individuals and families; responsibilities of a Family and Consumer Sciences professional.

FCSE-201 Teaching Methods in Family and Consumer Sciences Education (2-3 cr.)
ESC Fall and Spring
Presentation strategies appropriate in the field family and consumer sciences education. Background check required.

FCSE-300 Externship: Family and Consumer Sciences Community Education (4-8 cr.)
Fall and Spring
Practicum in one or more of the following family and consumer sciences education programs: extension services, elementary education, post- secondary education, occupational teaching experience and community educational services. Approval of graduate program director required if taken for graduate credit. Consent of program director.

FCSE-320 Career and Technical Education Programs in Family and Consumer Sciences Education (2 cr.)
Fall and Spring
Techniques, materials and curriculum for family and consumer sciences education wage-earning programs in secondary and post-secondary schools, preliminary procedures for program development. Education majors: Benchmark I completed.

FCSE-341 Clinical Experience in Schools(1 cr.)
Fall and Spring
Supervised experience in classroom teaching for development of motor, perceptual, social and cognitive learning through family and consumer sciences education substantive areas. Education majors: Benchmark I completed. **R**

FCSE-380 Consumer Economics (3 cr.)
Spring
Personal and family consumer economics for family and consumer education programs; management of human and non-human resources in achieving personal, family and community goals.
Prerequisites: take ECON-201 or ECON-210.

FCSE-385 Family Housing (3 cr.)
Fall
Individual/family's housing needs and resources as a basis for family and consumer education programs. The impact of historical, environmental, social, cultural, and technological, aesthetic, and design influences.

FCSE-390 Family and Consumer Sciences Education Curriculum and Evaluation (4 cr.)
Spring
Development of curriculum and evaluation tools for family and consumer sciences education subject matter and critical thinking skills. Benchmark I completed.

FCSE-397 Field Experience in Family and Consumer Sciences Education (2 cr.)
Fall, Spring and Summer
Field experience related to family and consumer sciences education skills and knowledge used in teaching wage-earning courses at secondary level.

FCSE-448 Student Teaching — Family and Consumer Sciences Education (8-16 cr.)
Fall and Spring
Student teaching practicum in K-12 settings in family and consumer sciences education/ family life. Consent of program director. Minimum cumulative GPA 2.75.
Prerequisites: take FCSE-301, FCSE-360.

FCSE-451 Family Life Education Programs (2 cr.)
Fall and Spring
Development of family life education programs including methods, materials and techniques for teaching family relationships and child development at the secondary level.

FCSE-488 Internship Teaching (8-16 cr.)
Fall and Spring
Alternate method of obtaining student teaching experience. Teacher interns receive license to teach and salaried appointments in cooperating school systems for one semester.
Prerequisites: take FCSE-301.

FCSE-497 Field Experience in Family and Consumer Sciences Education (2 cr.)
Field experience related to family and consumer sciences education skills and knowledge used in teaching wage-earning courses at secondary level.

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FN Food and Nutrition

FN-101 Dietetics as a Profession 1 cr.
Fall
Survey of types of dietetic and foodservice administration programs in the United States; role and function of staff; professional literature.

FN-102 Nutrition For Healthy Living 2 cr.
HPE HLTH
Fall and Spring
Food selection and eating patterns/standards, applied nutrition knowledge and interrelationships, nutrition information source analysis, weight management, the nutrition- exercise-fitness connection. Analysis of personal lifestyle and food patterns in relationship to optimal physical and mental well being.

FN-106 Nutrition in the Hospitality Industry 2 cr.
Fall and Spring
Basic principles with application to the hospitality industry. Basic physiological nutrition; cultural and psychological influences on food preference. Interpretation of nutrition information, food composition data, and discussion of appropriate products and services. Nutrition analysis and programming on and off the computer will be stressed. Not appropriate for students with credit in FN-202 or FN-212.

FN-111 Food Systems and Technology Futures 1 cr.
Fall
Introduction to food systems and technology with emphasis on trends, career opportunities and competencies required for success in the concentration areas of food systems management, food science, food merchandising and distribution and food communication.

FN-115 Principles of th Food Industry 2 cr.
Analysis of food processes, procedures, and regulations. Application to protocols of the food industry. Appreciation of safety and health food service products.

FN-124 Foods 4 cr.
Fall and Spring
Scientific principles and application in the selection, preparation and service of food.

FN-202 Food and Beverage Distribution Industry 3 cr.
An introductory course for students in the field of food and beverage merchandising and distribution. A study of history, evolution, classification, manufacture/production, packaging, distribution, and merchandising with an emphasis on trends and employment. Resource persons from industry and field trips will be utilized.

FN-207 Medical Terminology 1 cr.

Fall and Spring
Medical terminology for allied health occupations. Self-paced instruction utilizing a word-building system to learn word parts used to construct or analyze new terms. Emphasis on spelling, definition, usage and pronunciation.

FN-208 Management of Food Production 3 cr.
Fall and Spring
Development and application of management principles to decision making in small batch food production which is based on menu driven concepts. Prerequisites: take one group: take FN-124 and FN-212, or take FN-212 and FN-240. **$**

FN-212 Nutrition 3 cr.
Fall and Spring
Basic principles of nutrition applied to current issues in health maintenance. Prerequisites: take BIO-132 or BIO-234, and take CHEM-115 or CHEM-125.

FN-215 Art and Science of Food 3 cr.
Fall and Spring
Analysis and applicationof food principles applied to storage, preparation and service. Special emphasis on food safety and the art of food preparation. Prerequisites: take HT-121.

FN-220 Outdoor Cooking 1 cr.
Food preparation principles in cooking and serving outdoors; equipment for outdoor food preparation; foods for camping, backpacking and canoe camping; preparing wild game and gathering and preparing wild foods.

FN-222 Food Technology 2 cr.
TECH GLP
Fall, Spring and Summer
Food processing technology and how it impacts society, individual health and well-being, environment and the future; technological innovations and new developments to meet the changing requirements of society and increasing global demand for food. **$**

FN-225 Spec Topics in Food and Nutrition 1-2 cr.
Summer
Study of special topics in food and nutrition. Equivalent to 229-225. **R $**

FN-236 Nutrition For Young Children 1-2 cr.
Fall, Spring and Summer
Impact of nutrition on growth, development and health of young children. Assessment of nutritional status, changing needs and eating patterns, the link between nutrition, dietary practices, and behavior, and translating current nutrition in formation into effective nutrition education strategies for children. Prerequisites: take FN-102 or FN-106.

FN-240 Food Science 4 cr.
Fall and Spring
Physical and chemical changes affecting selection, preparation and service of food. Prerequisites: take CHEM-201.

FN-260 Menu Planning and Design 2 cr.

Fall
Principles of menu planning, design and production for commercial and institutional food establishments.

FN-310 Lifespan Nutrition 3 cr.
Spring
Nutrition concepts and concerns associated with each lifespan stage; integration of social, psychological, cultural, economic, and legislative factors to develop issue-centered approaches to meet nutrition needs.
Prerequisites: take FN-102 or FN-106, and take one course in Biology.

FN-312 Nutritional Assessment 2 cr.
Fall and Spring
Introduction to basic components of nutritional assessment as applied to individuals.
Prerequisites: take FN-212.

FN-320 Advanced Nutrition 3 cr.
Fall and Spring
Principles of human nutrition applied to individual, family, community and world problems.
Prerequisites: take FN-212 and CHEM-311.

FN-325 Special Topics in Food and Nutrition 1-3 cr.
Fall and Spring
Study of special topics in food and nutrition. **R**

FN-330 Institutional Menu Planning 3 cr.
Fall and Spring
Principles of cycle menu planning, design and marketing for institutional food settings, which includes culinary skills, basic food preparation and modified menus to meet the special dietary needs of an individual or group.
Prerequisites: take FN-212.

FN-342 Advanced Foods 3 cr.
Fall
Comparative studies of food selection and preparation; appraisal of foods. Prerequisites: take FN-124 or FN-240.

FN-350 Food Processing 3 cr.
Spring
Industrial methods used to prepare and preserve food. Prerequisites: Take FN-124 or FN-240; take MATH-120 and BIO-306; take CHEM-115 or CHEM-125 or CHEM-135.

FN-355 Sports Nutrition 3 cr.
Spring
Nutritional and metabolic requirements of physical activity. Metabolic fuel utilization during exercise and physiological adaptations to exercise training will be discussed. The health and well- being benefits of an optimal diet-exercise regime will be emphasized.
Prerequisites: take FN-320, CHEM-311 and BIO-234.

FN-360 Nutrition Counseling: A Team Approach 3 cr.

Fall and Spring
Inter-disciplinary team approach to individual and group client-centered nutrition counseling which includes assisting and advising clients on dietary information. Skills and techniques based on nutrition counseling theories that are most useful to registered dietitians in enhancing quality of life and planned nutrition intervention.
Prerequisites: take FN-312.

FN-380 Community Nutrition 3 cr.
Fall and Spring
Current status and legislation of community nutrition programs. Assessment of community needs and resources, program planning, funding, and evaluation. The role of the community nutritionist/home economist to help individuals, families, and communities solve nutrition problems. Prerequisites: take FN-212.

FN-397 Field Experience 2 cr.

FN-397C Field Experience Seminar: Dietetics 1-2 cr.
Field experience related to the dietetic areas. Prior approval of field position, 320 hours of work experience, and seminar. Written reports required for two-credit option.

FN-397E Field Experience: Dietetics 1 cr.
Field experience related to the dietetic areas. Prior approval of field position, 320 hours of work experience, and seminar. Written reports required for two-credit option.

FN-400 Food Quality 4cr.
The applications of qualitative and quantitative tools in conjunction with statistical methods to implement quality management in the food industry.
Prerequisites: take FN-350, STAT-130, or STAT-320.

FN-406 Nutrition Education 3 cr.
Fall and Spring
Nutrition education as planned behavioral change: problems and solutions in instructing various populations; identification, development and evaluation of nutrition resources.
Prerequisites: take FN-212.

FN-408 Preprofessional Development in Dietetics and Nutrition 1 cr.
Fall
Provides a step by step, efficient and effective process toward completion of application of Supervised Practice Programs (Dietetic Internship), graduate school, or employment.
Junior status or higher. **R**

FN-410 Food and Nutrition Policy Regulation and Law 3 cr.
Fall
Food and nutrition policy development and evolution. Key acts and agencies governing food regulation and law. Process of creating or changing law. Compliance and enforcement rules in
inspection, labeling, export and import. Administrative practice in food law including proceedings and judicial review.

FN-413 Maternal and Child Nutrition 3 cr.

Fall

Application of principles to maternal, infant, child and adolescent nutrition.

Prerequisites: take FN-212 and BIO-132, or take FN-212 and BIO-234.

FN-414 Catering 3 cr.

Spring

Theory and application of operational and managerial principles for on/off-premise catering for special events. Cannot be taken for credit by students who have previously taken HT-424.

Prerequisites: take FN-124 or FN-240. **$**

FN-415 Nutritional Issues in Gerontology 3 cr.

Theory and relationships of nutrition, longevity and aging. Food and nutrition legislation for the elderly--theory and implementation. Nutritional implications of acute and chronic disease states common among the elderly.

Prerequisites: take FN-320 and CHEM-311.

FN-417 Medical Nutritional Therapy I 3 cr.

Fall

Principles and methods for use in certain pathological conditions or chronic and acute disease processes. Incorporates principles of medical nutritional therapy in nutrition assessment, diet prescription, medications, care plans and documentation.

Prerequisites: take FN-312.

FN-418 Medical Nutritional Therapy II 4 cr.

Fall and Spring

Principles and methods for use in certain pathological conditions or chronic and acute disease processes. Incorporation of the principles of nutrition assessment, diet prescription, medications, care plans, and documentation into the management of disease processes.

Prerequisites: take FN-312.

FN-418 Diet Therapy 4 cr.

Fall and Spring

Principles and methods for use of diet as therapy in certain pathological conditions.

Prerequisites: take FN-320 and BIO-362.

FN-420 Food Styling 1-3 cr.

Fall

Food as media for artistic expression; effective use of color, form and texture.

Prerequisites: take FN-124 or FN-240. **R**

FN-431 Readings in Food Science and Nutrition 1-2 cr.

Critical reading, evaluating, and reporting from pertinent current journals and other publications. **R**

FN-438 Experimental Foods 3 cr.

Fall and Spring

Experimentation with selected food materials, techniques and equipment; directed study in individually chosen area.

Prerequisites: take FN-124 or FN-240; take CHEM-115 or CHEM-125 or CHEM-135.

FN-442 Basic Sensory Analysis 3 cr.
Spring
Basic understanding of the psychobiology and physiology of senses and the role both play in consumer product acceptance. Basic tests of sensory analysis, including both objective trained panel difference tests and subjective preference/acceptance tests. Appropriate for all majors who produce products for/or merchandise to consumers.
Prerequisites: take FN-124 or FN-240.

FN-450 Food Engineering 3 cr.
Fall
Application of pertinent chemistry, physics and mathematics principles to food processing.
Prerequisites: take CHEM-201, MATH-153, MATH-154, and FN-350.

FN-461 Multicultural Aspects of Food and Nutrition Patterns 3 cr.
ESC Fall and Spring
Food and nutrition patterns as influenced by social, religious, geographical, economic and political factors. Cultures emphasized include Native American, African American, Hispanic and Asian American. Food as a means of cross-cultural communication.
Prerequisites: take FN-124 or FN-240.

FN-470 Food Distribution Operations and Control 3 cr.
Current trends and management strategies in the distribution of food and beverages, from manufac- turer to consumer.
Prerequisites: take FN-202 BUMKG-330.

FN-497C Field Experience: Food Systems and Technology 1 cr.
Seminar: analysis, interpretation and synthesis of food systems and technology principles through a written paper and oral seminars following 320 hours of field work in an approved position. Integrates synergistic principles/activities from program courses and among concentrations.

FN-497E Field Experience: Food Systems and Technology 1 cr.
Food systems and technology area field experience. Approved field position, 320 hours of work experience, and development of concept/outline for written analysis paper.

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FREN French

FREN-101 Elementary French I (4 cr.)
COMSK LANG FGLP Fall
Listening, pronunciation, reading, and writing. Basic vocabulary, polite phrases, questions and answers. Adjective agreement, present and some past-tense verbs. Cultural information about the French-speaking world.

FREN-102 Elementary French II (4 cr.)
COMSK LANG FGLP Spring
Second level of understanding, speaking, reading, and writing in French. Introduction to future, conditional, imperfect and subjunctive verbs. Direct and indirect object pronouns. Short spontaneous and directed conversations. Topics in cultures of French-speaking people. One year of high school French or FREN-101 required.

FREN-121 Practical French I (2 cr.)
FGLP Fall and Spring
First quarter college French. Conversational phrases and vocabulary for practical situations. Basic present tense verb patterns. Intensive pronunciation drill. Not for students who have taken FREN-101.

FREN-122 Practical French II (2 cr.)
COMSK LANG FGLP Fall and Spring
Second quarter college French, conversational phrases and vocabulary, irregular and past tense verb patterns. Not appropriate for students who have completed FREN-101 (328-101). One year of high school French or FREN-121 Required.

FREN-123 Practical French III (2 cr.)
COMSK LANG FGLP Fall and Spring
Third quarter college French. Imperfect and reflexive verbs, direct and indirect object pronouns, commands, conversational vocabulary.(Not for student who have complete FREN-102.) One year of high school French or FREN-101 required.

FREN-124 Practical French IV (2 cr.)
COMSK LANG FGLP Fall and Spring
Fourth quarter college French. Future, conditional and subjunctive verbs. Introduction to relative pronouns. Conversational vocabulary. (Not for students who have completed FREN-102.)

FREN-201 Intermediate French I (4 cr.)
HUM FLC FGLP Fall
Vocabulary development through readings and discussion on French and Francophone civilization. History, art, music, short stories and poems, including contemporary culture. Taught in French. Two years of high school French or FREN-102 required.

FREN-202 Intermediate French II (4 cr.)
COMSK LANG FGLP Spring
Grammar review, contemporary vocabulary, free conversation in French. Three years of high school French or FREN-201 required.

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GCM Graphic Communications Management

GCM-141 Graphic Communications (3 cr.)
Fall, Spring and Summer
Overview of the graphic communications industry and hands-on introduction to production workflow from design through delivery. Digital premedia (for print and web), printing processes, postpress and finishing, raw materials, buying and specifying printed products and non-print graphic services.

GCM-151 Premedia Tools and Processes (3 cr.)
Fall, Spring and Summer
Digital premedia tools and processes for print and non-print graphics production. Premedia software, image capture/ creation, pagination, imposition principles, film assembly, proofing, and platemaking.
Prerequisites: take GCM-141.

GCM-251 Digital Premedia File Creation (3 cr.)
Fall, Spring and Summer
Digital creation, capture and manipulation of graphics for color layouts for print and digital distribution. Premedia systems, workflow, color theory, scanning, digital photo, bitmap and vector graphic creation and editing. File and font management, document layout, proofing, preflight, PDF creation and submission of files for layout.
Prerequisites: take GCM-151 or DES-220.

GCM-266 Digital and Offset Press Systems (3 cr.)
Fall and Spring
Imaging paper of other substrates via offset lithography and digital printing methods from an output-ready digital file. Image carriers, press systems, process control, densitometry, colorimetry, ink, toners, and substrates. Reproduction of line and halftone copy, in multiple and process colors.
Prerequisites: take GCM-141.

GCM-270 Postpress Operation and Planning (3 cr.)
Fall and Spring
Current and emerging technologies for postpress operations in bindery and finishing. Postpress production and job planning from the postpress perspective. Quality control tools and techniques as applied to postpress operations.
Prerequisites: take GCM-141.

GCM-300 Workshop (1-3 cr.)
Fall, Spring and Summer
Special topics in graphic communications, providing hands on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

GCM-351 Cross-Media Marketing Systems (3 cr.)
Fall and Spring

Software and systems used to plan and produce personalized and integrated cross-media (Web, print, PDF, e-mail) marketing/promotion communication. PDF editing and repurposing, digital asset management, databases, layout issues, dynamic content, scripting, automation, variable data digital printing and personalization, digital distribution alternatives, and web storefronts.
Prerequisites: take GCM-251.

GCM-356 Color Electronic Prepress (3 cr.)
Fall, Spring and Summer
Electronic capture, manipulation, and evaluation of color images for presentations and print production. Work flow, system, and file management issues faced in complex page layout.
Prerequisites: take 1 option: take GCM-141 and GCM-151, or take GCM-141 and DES-220.

GCM-362 Screen and Specialty Print Manufacturing (3 cr.)
Fall and Summer
Applications and techniques for screen and specialty printing on a variety of substrates. Issues and process-control concerns related to these image transfer methods.
Prerequisites: take GCM-141. **$**

GCM-363 Package Printing (3 cr.)
Fall and Spring
The production of graphics on labels, cartons, and flexible packages with an emphasis on flexography and rotogravure. Present and future technology trends in package printing.
Prerequisites: take GCM-141. **$**

GCM-367 Color Management (3 cr.)
Fall and Spring
Industry standards-based color management practices for accurate color reproduction throughout both RBG and CMYK workflows. Colorimetric and densitometric analysis. Device calibration and profiling. Color management software applications, devices and techniques for controlling image capture, monitor display, soft proofing and analog or digital printing.
Prerequisites: take GCM-266 and either STAT-130 or STAT-320. **R**

GCM-380 Graphic Communications Estimating and Scheduling (3 cr.)
Fall and Spring
Graphic communications workflow management issues including cost of production or services, estimating practices, production scheduling and coordination of both print and non-print graphic communications projects.
Prerequisites: take GCM-251, GCM-266, and GCM-270; take INMGT-200; and take BUACT-201 or BUACT-206.

GCM-443 Graphic Communications Practicum (3 cr.)
Fall, Spring and Summer
Integration of all graphic communications manufacturing processes in the design and production of print and non-print graphic products and services for clients in the university community. Special emphasis on the process and workflow management roles of estimating, customer service, scheduling, planning, production supervision and quality control.
Prerequisites: take GCM-351, GCM-266, and GCM-380; Corequisite: GCM-495. **R**

GCM-445 Publication Production (3 cr.)
Fall, Spring and Summer
Cross-discipline work teams experience integration of skills developed in English, speech, art, graphic communications, industrial management and business courses to design, plan, schedule, produce and distribute print and digital versions of a magazine/newsletter.
Prerequisites: take GCM-141.

GCM-446 Digital Imaging (3 cr.)
Fall and Spring
Preparation, capture and manipulation of digital information for current and emerging digital distribution technologies. Repurposing of print media files for alternative distribution systems.
Prerequisites: take GCM-356.

GCM-470 Graphic Communications Distribution Management (3 cr.)
Fall and Spring
Systems and processes used in distribution and delivery of printed products. United States Postal Service, parcel delivery, shipping, warehousing and fulfillment. Regionalization, personalization, print-on-demand, demographic binding and emerging distribution strategies.
Prerequisites: take GCM-270

GCM-475 Graphic Communications Cost Estimating (3 cr.)
Fall and Spring
Estimating production costs and establishing budget hourly rates and completion time for tasks associated with graphic reproduction. Utilization of a computer integrated manufacturing (CIM) information system to facilitate estimating and managing production processes based on data collected from manufacturing floor real-time terminals.
Prerequisites: take GCM-141, and take BUACT-200 or BUACT-206.

GCM-480 Graphic Communications Customer Service And Administration (3 cr.)
Fall and Spring
Administrative, management and leadership roles in directing functional areas of graphic communications companies including sales, customer service, management, human resources, and training. Senior level or higher.
Prerequisites: take GCM-380.

GCM-495 Graphic Communications Management Seminar(3 cr.)
GLP
Fall, Spring and Summer
Overview of the graphic communications industry; its size, market segments, profitability and organization. Research and analysis of company annual reports. Strategic planning, management and leadership, industry trends and forecasts, trade organizations, news and other information sources. Impact of technology, global issues, and competing information distribution channels. Senior level or higher.
Prerequisite: take GCM-349 or GCM-449.
Corequisite courses: GCM-443. **R**

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GDD Game Design and Development

GDD-101 Introduction to Video and Computer Game Design and Development (3 cr)
Fall
Principles of video and computer game design and development. Students design and develop games, analyze a popular game, and learn about various aspects of the game industry. Game design, story development, visual art production and programming.

GDD-325 Two Dimensional Game Design and Development (4 cr)
Hands-on experience designing video games. Design and develop two-dimensional games from concept to completion in teams. Production environment will be setup to reflect the approach used in the game development industry.

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GEM Golf Enterprise Management

GEM-101 Introduction to Golf Enterprise Management 1 cr.
Overview of the golf industry, national and international golf associations, careers in the golf industry, and the B.S. in Golf Enterprise Management.

GEM-149 Cooperative Education / Internship 1-6 cr.
Work and study in an approved position to gain business/industry experience. Generally entails recurring, supervised work periods, each one building and expanding on the previous one.

GEM-201 Principles of Golf Enterprise Management 3 cr.
Comprehensive survey of golf facility operations and management from perspectives of resort, private, semi-private, and daily fee courses, to include principles of business and customer service, human resource management, course design and management, retail and back shop operations, food and beverage management, and event planning.

GEM-249 Cooperative Education / Internship 1-6 cr.
Work and study in an approved position to gain business/industry experience. Generally entails recurring, supervised work periods, each one building and expanding on the previous one.

GEM-250 Turfgrass Management for Golf Courses 3 cr.
Investigates the broad subject of turfgrass management. Emphasis is placed on the application of basic turfgrass principles to golf course turfgrass culture.
Prerequisite: take GEM-101.

GEM-277 Software and Technology 3 cr.
Investigates the use of software and technology in the golf industry. Marketing, revenue planning,tee time management, point of sale, guest and staff scheduling and performance evaluation will be analyzed using proprietary industry software.
Prerequisites: take GEM-101.

GEM-301 Customer Development, Retention and Marketing 3 cr.
Current trends and programs for golf course customer recruiting and retention, marketing strategies, conducting and applying market research including database and internet marketing for golf course customer development and retention in public fee, semi-private, private and resort facilities.
Prerequisites: take GEM-101 and GEM-201, and take BUMKG-330 or HT-251

GEM-349 Cooperative Education / Internship 1-6 cr.
Work and study in an approved position to gain business/industry experience. Generally entails recurring, supervised work periods, each one building and expanding on the previous one.

GEM-350 Golf Course Soils, Layout, and Designs 3 cr.
Golf course layout and design, soil characteristics that affect successful turf grass establishment and maintenance. Topics include soil components, soil physical and chemical properties, drainage, irrigation, golf course layout, design and construction, and risk assessment.
Prerequisites: take GEM-101 and GEM-201

GEM-445 Event Management 3 cr.
Planning, organizing and the management of events will be investigated for the hospitality, tourism and golf industries. Emphasis is placed on the design, internal management systems and post event evaluation.

GEM-450 Environmental Golf Course Management 3 cr.
Emphasizes the applied knowledge realted to golf course operations and environmental perspective towards effective management.
Prerequisites: take GEM-250.

GEM-449 Cooperative Education / Internship 1-6 cr.
Work and study in an approved position to gain business/industry experience. Generally entails recurring, supervised work periods, each one building and expanding on the previous one.

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GEOG Geography

GEOG-104 World Geography 3 cr.
SBSCI GEOG GLP Fall and Spring
Introduction to regional and cultural geography of the world; physical and human resources of major areas of the globe.

GEOG-251 Introduction to Geography and Geographic Information Systems 4 cr.
SBSCI GEOG GLP Fall, Spring and Summer
Introduction to the regional and cultural geography of the world, cartography, physical and human resources of major areas of the globe and related geographic information. Introduction to Geographic Information Systems (GIS) and its use in a variety of applications.

GEOG-351 Intermediate Geographic Information Systems 4 cr.
Fall, Spring and Summer
Basic analytical operations in Geographic Information Systems using GIS software.
Prerequisites: take GEOG-251.

GEOG-451 Advanced Geographic Information Systems 4 cr.
Fall, Spring and Summer
Integration of GIS and analytical and quantitative methodologies using spatial analysis, geostatistical analysis, network analysis, and 3D analysis.
Prerequisites: take GEOG-351.

GEOG-452 Geographic Information Systems Research Applications 2-4 cr.
Fall, Spring and Summer
Individualized research applying advanced GIS techniques to problems related to students' areas of study under the supervision of faculty members in their programs. Students plan, design and execute GIS projects which build geographic databases, analyze data spatially, and present results.
Prerequisites: take GEOG-451.

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HDFS Human Development and Family Studies

HDFS-101 Introduction To Human Development and Family Studies (1 cr.)
Fall and Spring
Fields of human development and family studies; occupational opportunities in programs serving families and children.

HDFS-115 Individual and Family Relations (3 cr.)
ESC
Fall and Spring
Dynamics of social-psychological forces affecting family interaction. Explorations of courtship, husband-wife, parent-child relationships.

HDFS-124 Human Development: Early Childhood (3 cr.)
Fall and Spring
Principles and theories of growth and development prenatal through age 8, with a systemic perspective on physical, motor, cognitive, language, social and emotional development. Observations required.

HDFS-195 Honors Seminar: Lifespan Human Development (3 cr.)
SBSCI PSYC
Fall
Review, discuss and analyze theories of human development across the lifespan. Acceptance into Honors Program.

HDFS-215 Dynamics of Family Development (3 cr.)
ESB
Fall and Spring
A study of the family with emphasis on environmental factors significant in marriage and family relationships.
Prerequisites: take HDFS-115.

HDFS-225 Skill Training for Individual and Family Interventions (3 cr.)
Fall and Spring
Concepts and skills in developing rapport, assessing goals and initiating change with children, parents, couples and families across the life span in professional settings.

HDFS-255 Lifespan Human Development (3 cr.)
SBSCI PSYC ESC
Fall and Spring
Lifespan individual development. Critical examination of influences on individual development across the lifespan.

HDFS-257 Lifespan Sexuality (3 cr.)

HPE HLTH
Fall and Spring
Introduction to human sexuality over the lifespan, utilizing individual and family perspective. Focus is development of sexual behavior, relationships, and gender characteristics from infancy to late life.

HDFS-264 Child Guidance (3 cr.)
Fall and Spring
Developmentally appropriate principles and strategies for child guidance. Systems perspective, positive discipline, theoretical approaches, current topics, developing a personal/eclectic approach.
Prerequisites: take HDFS-124.

HDFS-270 Seminar On Self-Growth (3 cr.)
Fall and Spring
Course in personal growth and self-management. A starting point in working with families in the diverse world is to begin with an understanding of self. Learning strategies are aimed at bridging theory with real life experiences.

HDFS-275 Race Matters: Interdisciplinary Investigations (3 cr.)
ESA
Fall and Spring
Cognitive and emotional skills for race learning. Types of racism. How to talk about race. Exploring race in our lives: relationships, media, education, politics. Anti-racist strategies.

HDFS-310 Family Stress, Coping and Adaptation (1 cr.)
Fall, Spring and Summer
Impact of family development and stress on individual and family well-being.

HDFS-313 Parent Education and Involvement (2 cr.)
Fall and Spring
Parent groups: training of leaders, survey of literature.

HDFS-320 Divorced, Single Parent and Remarried Family (2 cr.)
Fall and Spring
Trends and issues in divorce, single parenting and remarriage related to effects on adults, children and society.

HDFS-325 Human Development: Middle Childhood and Adolescence (3 cr.)
Fall and Spring
Empirical study of physical, intellectual, social and emotional development of children.

HDFS-330 Human Development: Early and Middle Adulthood (3 cr.)
Fall and Spring
Study of adults in the family context during the early and middle years.
Prerequisites: take HDFS-215.

HDFS-332 Death and Bereavement (3 cr.)
Spring and Summer
Significance of death and bereavement for the American culture, individual and family. Special consideration given to major tasks of grieving for children and adults.

HDFS-335 Seminar: Culturally Diverse Individuals and Families (2 cr.)
ESA GLP
Fall and Spring
Study of cultural, ethnic, racial and economic influences on individuals and families in the United States. Emphasis on knowledge and skills to improve human relations in settings serving individuals and families.

HDFS-336 Experience: Developing Cultural Competence (2 cr.)
ESA
Fall and Spring
Fifty hours experience interacting with individuals and/or families of an ethnic minority group whose background the student does not share; and/or foreign-born persons of color, persons with disabilities, sexual minorities and persons of various ages and socio-economic groups.

HDFS-340 Human Development: Late Adulthood (3 cr.)
Fall and Spring
Survey of the field of gerontology focusing on what it means to grow old in the United States from a systemic perspective. Multicultural attitudes toward aging; the psychological, physical, social and economic needs and problems of the older population are addressed. Consideration will be given to the personal, familial, environmental and social resources of the older population.
Prerequisites: take HDFS-215.

HDFS-341 Family Caregiving to Dependent Elders (1 cr.)
Fall and Spring
Unique challenges confronting adult children who provide care to aging parents. Government, agency, workplace and family policies and practices promoting and/or undermining family strengths and well-being.

HDFS-345 Health Care Dilemmas and Decisions for Families (3 cr.)
Fall and Spring
Multidisciplinary study of bioethical issues facing U.S. families, including end-of-life decision making, reproductive technologies, and distributive justice.

HDFS-347 Ethics in Aging (2 cr.)
Ethical issues related to aging emerging from advances in medicine and medical technology from a multidisciplinary perspective.

HDFS-350 Women's Relationships in Later Life (3 cr.)
Women's experiences in later life. Impact of race, culture, class, sexual orientation upon aging. Images of aging women in contemporary literature and the media. Older women's experiences in familial relationships and friendships. Junior level or higher.

HDFS-352 Sexual Minority Individuals and Families (2 cr.)
Contextual knowledge and understanding o sexual minority individuals and families.

HDFS-360 Work and Family Issues (3 cr.)
ESC
Fall and Spring

Effects of employment and family careers and varying patterns of combining work and family.

HDFS-364 Sibling Relationships (3 cr.)
Spring
Sibling relationships across the life course, examining the issues, processes and dynamics affecting these bonds.

HDFS-365 Family Resource Management (3 cr.)
Fall and Spring
Examination of individual and family use of resources to attain goals. Exploration of methods for working with individuals and families regarding family resource management. Identificaion of socio-cultural influence of poverty and decision making.
Prerequisites: take HDFS-115.

HDFS-375 Grantsmanship for Nonprofits (1-2 cr.)
Explore the availability of foundation grant money for nonprofit organizations. Designed to give the beginning grant writer an overview of grant purposes, foundation funding sources, proposal development and writing.

HDFS-395 Special Topics in Human Development (1-2 cr.)
Special topics in human development; repeatable for different topics. Junior level or higher. **R**

HDFS-420 Family Research and Methodology (3 cr.)
Fall and Spring
Analysis of family theory, research methodology and selected topics in family relations.
Prerequisites: take HDFS-115 HDFS-215.

HDFS-423 Spirituality Across the Lifespan (2 cr.)
Seminar discussion of autobiographical and biographical accounts of individual's spiritual experiences, beliefs and spiritual development over the life cycle. Junior level or higher.

HDFS-426 Special Topics in the Study of Family Life (1-3 cr.)
Family life programs and literature; individual study of problems of personal or professional interest.

HDFS-440 Child and Family Law (3 cr.)
Spring
Legal issues affecting children and families.
Prerequisites: take HDFS-215.

HDFS-442 Geriatric Functional Assessment (4 cr.)
Fall
Multi-disciplinary assessmnet applied to elderly at critical transition points. Assessment of social and economic status, functional status (activities of daily living and instrumental activities of daily living), mental health, and environmental characteristics. Explore variou measurement instruments. Background check required.
Prerequisites: take HDFS-340.

HDFS-450 Family Policy (3 cr.)

Fall and Spring
Content, methods and process of assessing impact of public policy on children and families.
Prerequisites: take HDFS-215.

HDFS-454 Suicide and the Family: Family and Community Intervention (1 cr.)
Analysis of attempted and completed suicides from an interdisciplinary perspective. Forms of intervention, with emphasis upon family therapy, are compared, contrasted, and evaluated for suitability.
Prerequisites: take HDFS-215.

HDFS-456 Abuse and the Family (3 cr.)
Fall and Spring
Definition and analysis of types of abuse in family context. Interrelationship of victims, perpetrators, other family members, helping professionals, social context. Risk factors, effects, reporting and recovery.
Prerequisites: take HDFS-215.

HDFS-490 Professional Issues: Human Development and Family Studies (2 cr.)
Fall and Spring
Issues related to professional development in areas of human development and family studies. 2.5 GPA in professional core. HDFS majors only.

HDFS-491 Practicum in Human Development and Family Studies(4-8 cr.)
Fall, Spring and Summer
Practicum experience in human development and family studies. Student will be placed in community agency or organization and supervised by site supervisor and university supervisor. 2.5 GPA in Professional Core. Consent of Program Director.
Prerequisites: take HDFS-490. **R**

HDFS-497 Field Experience in Human Development and Family Studies (2 cr.)
Field experience related to human development and family studies skills and knowledge used in teaching wage-earning courses at secondary level.

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HIST History

HIST-120 Early United States History 3 cr.
HUM HIST ESB Fall, Spring and Summer
U.S. history to 1865: political, economic and social forces that have shaped the nation to close of Civil War.

HIST-121 Modern United States History 3 cr.
HUM HIST ESB Fall, Spring and Summer
U.S. history since 1865: political, economic and social forces that have shaped the nation since close of Civil War.

HIST-140 Western Civilization 3 cr.
HUM HIST Fall and Spring
Survey of Western civilization along the Nile, the Fertile Crescent, through Greece, Rome, the Middle Ages, the Renaissance, and the Reformation.

HIST-141 Western Civilization 3 cr.
HUM HIST Fall and Spring
Survey of Western civilization from Reformation to present.

HIST-210 Modern World 3 cr.
HUM HIST Fall, Spring and Summer
Modern trends in terms of historical backgrounds as frame of reference for interpreting modern world.

HIST-311 Women and War: A Global Perspective in the Modern Era 3 cr.
HUM HIST GLP Spring
Examines the lives and roles of women in conflicts from 1789 to the present during wars in Europe, Africa, Asia and Latin America, with minor focus on the United States.

HIST-321 United States Women's History 3 cr.
HUM HIST ESB Fall and Spring
Political, economic, and social contributions of women to United States history. Examination of the historical interaction of ethnicity, class, and sexual orientation with gender. Strong focus on the changes in gender expectations and the historical creation of stereotypes and inequality.

HIST-322 African-American History 3 cr.
HUM HIST ESA Fall and Spring
Social, cultural, economic and political history of African-Americans, with special focus on the United States.

HIST-330 History of World War II 3 cr.

HUM HIST Fall and Spring Semesters
Causes, conduct and effects of World War II.

HIST-335 Wolrd War II: An Ethnic and Global Perspective 3 cr.
HUM HIST ESB GLP Spring and Summer
Examines World War II through exploration of ethnicity and race both in the United States and abroad. Sophomore standing.

HIST-350 History of the Vietnam War 3 cr.
HUM HIST ESC Fall and Spring
American role in the Vietnam War, particularly goals, objectives and dilemmas faced by American policymakers; roles and contributions of American men and women in the military and in civilian society; development and impact of the anti-war movement; and long-term consequences of the war on American culture and society.

HIST-360 Asian History 3 cr.
HUM HIST Fall and Spring
Survey of political, social, religious and economic history of Asia, India, China, Japan and the Philippines in modern world.

HIST-380 Latin American History 3 cr.
HUM HIST
Political, social and economic history of Middle and South America, pre-Columbian to present.

HIST-460 History Methods 2 cr.
Fall and Spring
Historiography and application of the historical method, including the study of teaching methods, instructional materials, and evaluation techniques. History minors only.

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HLTED Health Education

HLTED-360 Personal Health and Fitness (3 cr.)
Spring and Summer
Analysis of consequences of individual decisions and lifestyle choices related to personal health and well being.

HLTED-375 Methods in Health Education (2 cr.)
Fall
Teaching methods related to the content of elementary and secondary school health curriculum. Individual presentations and teaching of health lessons.

HLTED-376 Organization and Administration of Health Education (3 cr.)
Spring and Summer
Planning, promoting, and implementing comprehensive health education programs at the elementary, middle, and secondary levels. Needs assessment; curriculum development and coordination; public relations; and the development of cooperative relationships with parents, private business, and voluntary and community health agencies.

HLTED-485 Health Education Student Teaching (2 cr.)
Fall and Spring
Directed teaching and community experiences in selected off-campus schools.

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HLTH Health

HLTH-101 Discovering Wellness 1 cr.
HPE HLTH Fall and Spring Semesters
Introduction to the components and benefits of high level wellness; includes self-assessment and the development of an action plan for lifetime wellness.

HLTH-340 ARC Standard First Aid and Personal Safety 2 cr.
Fall, WinTerm, Spring and Summer
American Red Cross certification in standard first aid and personal safety; increase personal safety and accident-prevention knowledge; learn to administer emergency first aid to self or others. **$**

HLTH-346 ARC Cardiopulmonary Resuscitation .5 cr.
Fall, Spring and Summer
Techniques of basic life support: Recognizing respiratory and/or cardiac arrest and properly administering cardiopulmonary resuscitation (CPR) to maintain life. Successful completion results in 1-year certification in ARC basic life support course in CPR.

HLTH-350 Prevention and Care of Athletic Injuries 3 cr.
Spring Semester
Provides prospective physical education and/or coaching professional with basic understanding of prevention, treatment and care of athletic injuries.
Prerequisites: HLTH-340; and BIO-142, BIO-134 or HLTH-355.

HLTH-355 Kinesiology 3 cr.
Spring Semester
Body movements and principles affecting them.
Prerequisite: BIO-132.

HLTH-365 Physiology of Exercise 3 cr.
Spring Semester
Effects of exercise on sports participants: heat stress, body composition, nutrition, cardiovascular function, energy expenditure, respiratory mechanics and ventilation factors.
Prerequisite: BIO-132.

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HT Hospitality and Tourism

HT-100 Introduction to Hospitality 2 cr.
GLP
Exploration of the major components and organizational structure of the hospitality industry. Presents historical development opportunities and current trends. Stresses the importance and relationship of education and work experience to career success. Examination of the key components in various industry sectors including food service, lodging, tourism, gaming, and property management,

HT-121 Principles of Foodservice Operations 2 cr.
Professional segments of foodservice operations: history, types of operations, functions, facilities design, equipment, basic cooking principles, dining room service, and management concepts.

HT-135 Lodging Systems 3 cr.
Examination of the basic skills needed in a lodging facility. Specific roles, functions, and policies pertaining to the Rooms Division.
HT-140 Principles of Tourism 3 cr.
GLP
Scope, structure, and function of tourism and as a industry and a sociocultural phenomenon; industry components and the importance of maximizing benefits and costs to its stakeholders.

HT-150 Institutional Food Purchasing 2 cr.
Methods of large-quantity food purchasing: determining standards, specific needs, and industrial offerings; formulating specifications, buying procedures and controls.

HT-200 Hospitality Organization Management 3 cr.
Management principles for hotels and restaurants, supervisory development and training, labor relations, managerial interpretation, and evaluation of current systems and procedures. Prerequisites: take HT-100.

HT-240 Tourism Goods and Services 3 cr.
GLP
Analysis of tourism goods and services in relationship to future patterns of supply and demand. Prerequisites: take HT-140 ECON-210.

HT-315 Gaming Management 3 cr.
Overview of casino gaming operations in the hospitality and tourism industry from a global and local perspective. Must be 18 years or older. **$**

HT-316 Casino Operations Management 3 cr.
Functions and transactions associated with the gaming operations environment within a resort casino. Must be 18 years or older.

HT-317 Psychosocial Issues in Gaming 3 cr.
A hospitality management and societal perspective of the pros and cons of gambling entertainment. Must be 18 years or older.

HT-323 Food Service Equipment 2 cr.
Factors affecting design, selection, physical facilities, and utilities involved in foodservice equipment.

HT-324 Quantity Food Production 4 cr.
Quantity food production management concepts: menu planning, work production schedules, production analysis, food and labor cost controls, sales, projections, crisis, and service management techniques; lab work in quantity food production and service; recipe development, and introduction to productivity and work simplification concepts.
Prerequisites:
BS HTRM students: Take FN-115, HT-121, and FN-215;
BS FST students: Take FN-124
BS Dietetics students: Take FN-240

HT-326 Introduction To Wines and Spirits 3 cr.
GLP
Applied and historical knowledge of wines and spirits from different regions of the world; emphasis on preparation, selection, accompaniment with food, basic cost control analysis, and service. Must Be 21 years or older. **$**

HT-330 Resort Planning and Operation 3 cr.
Planning and operation of individual destination resorts. Analysis of resort concept, history, master planning, environmental impact, facility design, maintenance and operational management. Prerequisites: take HT-430. **$**

HT-335 Lodging Operations Management 3 cr.
Investigation of supervisory roles in lodging management, with an emphasis on the importance of financial statements and their interpretation, human resources and productivity, and providing quality hospitality services within all types of lodging facilities. Prerequisites: take HT-135.

HT-340 Development of Tourism Attractions 3 cr.
Diversified natural and man-made background tourism elements (BTE): preservation and incorporation of concepts for development of tourism destinations. Prerequisites: take HT-140 and ECON-210.

HT-344 Hospitality and Tourism Marketing and Sales 3 cr.
Analysis of marketing strategies and sales techniques, promotional tools, and research for hospitality and tourism development. Must be junior level or higher.

HT-350 Hospitality Diversity Management 3 cr.
ESB
Analysis of multiculturalism and diversity in the hotel, restaurant and tourism workplace. Managing a diverse workforce in a logical and meaningful manner through understanding self perspectives, group identities, and workplace strategies.

Prerequisites: Junior level or higher.

HT-351 Hospitality Convention/Meeting Planning 3 cr.
The roles and responsibilities of professional hospitality meeting planners and hotel convention sales/service managers are examined for purposes of planning or hosting a major convention, or a corporate, association, or special group meeting event.
Prerequisites: take HT-344.

HT-352 Club Management 3 cr.
Managing a membership, city, health and fitness, military, golf, or other social or recreation club. Junior level or higher.

HT-353 Computer Systems for Food Service 3 cr.
Functions of computers in a variety of food service operations with specific emphasis on spreadsheets and food service application software. Experience using state-of-the-art technology and microcomputers.
Prerequisites: take HT-324 and HT-362.

HT-360 Tourism for Persons with Disabilities 2 cr.
Strategies to accommodate the inclusive and special hospitality and travel preferences of persons with disabilities within the hospitality and tourism industry.

HT-362 Foodservice Finance and Cost Control 3 cr.
The use of financial techniques and systems to control food, beverage, and labor costs in hospitality food service operations. Prerequisites: take BUACT-206.

HT-374 Principles of Timeshare Management 3 cr.
Introduction to timeshare management; similarities and differences between timeshare operations and other hospitality businesses. Tourism influences on timeshare development.

HT-383 Yield Management 3 cr.
Investigation of the use of computer technology in the lodging industry for revenue planning, scheduling and performance evaluation. Specialized software will be used to analyze and evaluate hotel performance. Prerequisites: take HT-135, HT-200, and STAT-130.

HT-418 Casino Tourism 3 cr.
Research/travel and visits with Chambers of Commerce, casino management personnel, and governing entities to study economic, sociological and cultural impacts of gaming within a particular global or local region. Must be 18 years or older and junior level or higher. **$**

HT-423 Wine and Food Pairing 4 cr.
GLP
Matching wine and food from different parts of the world using flavors, textures, and components present in food and wine as complementing strategies. Emphasis on menu planning, food preparation, cooking methods and wine tasting with foods. Prerequisites: take HT-326. **$**

HT-424 Catering 3 cr.

Theory and application of operational and managerial principles for on- or off-premise catering for special events. Junior level or higher. Prerequisites: take FN-124 and FN-260.

HT-426 Restaurant Operational Management 4 cr.
Application of the principles of food and beverage management in full service restaurants existing as independent units or as units within a commercial/ noncommercial foodservice operation. The course will emphasize fine dining, fine cuisine and control systems.
Prerequisites: take HT-324.

HT-427 Professionalism: Social and Work Environment 1 cr.
The application of necessary skills to be professional in social and work environments with emphasis on professional dress, proper dining etiquette, business conversation, and job search techniques. Non-HRTM majors only **$**

HT-430 Lodging Administration 3 cr.
Analysis of theories, principles and techniques of lodging management; problems and issues encountered by management in providing quality service within cost-efficient organization.
Senior level or higher. Prerequisites: take HT-383.

HT-440 Sociocultural Systems of Tourism 3 cr.
Various psychosocial dimensions of tourism: motivation, development, community and conflict as related to consumer-tourists, tourisiers and residents. Senior level or higher.

HT-442 Trade Show Management 3 cr.
Investigate and apply the processes and procedures to plan and manage a trade show from a developer and user perspective. Define the processes to select and develop, arrange for site and support services leading to a profitable trade show.
Prerequisites: take HT-351.

HT-445 Event Management 3 cr.
Planning, organizing and the management of events will be investigated for the hospitality, tourism and golf industries. Emphasis is placed on the design, internal management systems and post event evaluation.

HT-447 International Convention and Meeting Management 3 cr.
Investigate the process and procedures to plan for meetings in other countries.
Prerequisites: take HT-351.

HT-449 Cooperative Education / Internship 1-6 cr.
Work and study in an approved position to gain business/industry experience. Generally entails recurring, supervised work periods, each one building and expanding on the previous one. Prerequisites: must have 60 credits completed. **R**

HT-450 Food Service Administration 3 cr.
Organization and administration of institutional foodservice systems, personnel selection and training, cost control and problems of supervision.

HT-452 Hospitality Professionalism 2 cr.
Prepare hotel, restaurant and tourism students as professionals in a global community. Role-play

emphasis on professional dress, dining etiquette, culture and business conversation, job search and placement techniques. HRTM and Property Management majors only.

HT-454 Security and Risk Management For the Hospitality Industry 3 cr.
Advanced investigation of security and risk management within hospitality/service industries. **$**

HT-457 Hospitality Management Strategies 3 cr.
Comparison and synthesis of hospitality management strategies; concepts and theories in relationship to long-term hospitality business goals and objectives. Capstone course for senior-level hospitality and tourism students. Senior Level Or Higher. Prerequisites: take HT-362.

HT-460 Hospitality Industry Law and Liability 3 cr.
Laws applicable to ownership and operation of inns, hotels, motels, restaurants and other places of public hospitality.

HT-461 Hospitality Employee Relations 3 cr.
History and legal strategies and tactics in dealing with hospitality employees in both union and non-union settings.

HT-462 Hospitality -- Financial Analysis/Budget/ Forecasting 3 cr.
Application of accounting and financial analysis techniques to managerial decision-making in hospitality industry. Prerequisites: take BUACT-206, HT-361, and HT-362.

HT-481 Special Problems in Hospitality and Tourism 1-3 cr. **R**

HT-492 Seminar in Hospitality and Tourism Management 3 cr.
An advanced course in management. The student will select and research a current topic of importance to the industry. **R $**

HT-498 Hospitality and Tourism Field Experience 1-2 cr.
Off-campus work and study in an approved position to better understand the challenges and potentials of various careers in the hospitality area. Must have 90 credits completed.

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ICT Information Communication Technologies

ICT-103 Information and Communication Technologies (3 cr.)
TECH GLP
Fall, Spring and Summer
Examine the impacts of information and communication technologies on individuals and the global society and how its utilization affects personal, educational and professional growth.

ICT-304 Communications and Information Systems (1-3 cr.)
Fall, Spring and Summer
Overview of the communications industry. Use of systems to create, process, transmit, receive and evaluate information.
Prerequisite: take ICT-103.

ICT-305 Office Automation Technology (3 cr.)
Fall, Spring and Summer
Automation information concepts and technology use in office including communication, storage, and retrieval systems. Emphasis on cost effective selection and implementation problems.
Prerequisite: take ICT-103.

ICT-309 Collaborative Computing (3 cr.)
History application, design and analysis of collaborative computing.
Prerequisites: take ICT-103.

ICT-311 Information and Communication Technologies Analytics (3 cr.)
Determine the value of electronic information and communications. Developing metrics, determining acquisition, conversion, and retention on information and communication technologies.
Prerequisites: take ICT-103.

ICT-401 Information Technology Policy and Audit (3 cr.)
GLP
Fall and Spring
Information technology policy, regulatory and audit issues, international standards, and internal security strategies.
Prerequisites: take ICT-103 and BUACT-206.

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INMGT Industrial Management

INMGT-100 Introduction To Management (1 cr.)
Fall
Survey of management focusing on changes, challenges, opportunities, and management's roles in business and industry. Management program advisement, course sequence, and job opportunities. B.S. in Management and B.S. in Information and Communication Technologies majors only.

INMGT-120 Quality Concepts (3 cr.)
Fall, Spring and Summer
An introduction to quality, quality systems, and quality management through a survey of the various philosophies, principles, techniques and procedures used by various organizations and/or managers to assure customer satisfaction of product and/or service.

INMGT-200 Production and Operations Management (3 cr.)
Fall, Spring and Summer
A broad analytical "systems" viewpoint is used to develop competency in management decision-making and problem solving in an operations setting.
Prerequisites: take STAT-130, STAT-330 or STAT-320.

INMGT-210 Service Operations Management (3 cr.)
Fall and Spring
Examination of the environment in which services operate. The design of service delivery systems is addressed from the perspective of both customer participation and operations efficiency.

INMGT-220 Service Quality Assurance (3 cr.)
Fall and Spring
Determination of goals, management systems, and implementation methodologies for all aspects of service organization quality assurance.

INMGT-298 Field Experience (1-2 cr.)
Fall, Spring and Summer
Off-campus work and study in an approved position to better understand business and industrial concepts and practices. **R**

INMGT-300 Engineering Economy (2-3 cr.)
Fall, Spring and Summer
Source and application of funds: cost control, valuation, depreciation, replacement theory and taxation.

INMGT-301 Seminar (1-2 cr.)
(Title will reflect specific business or management content.) Current topics in business and industrial management to meet specific needs of students enrolled. **R**

INMGT-303 Introduction to Leadership Praxis (1 cr.)
Assessment of Leadership skills/characteristics, leading to understanding of integrative leadership, and including increased capacity for civic engagement, social justice action, and ethical decision-making.

INMGT-305 Resource Planning and Materials Management (3 cr.)
Fall and Spring
Principles and techniques for planning and managing materials and resources within organizations, and throughout a supply chain. Topics include: resource and material planning, forecasting, master planning, materials requirements planning, capacity management, purchasing, inventory management, distribution options, supply chain management and various operational management techniques.
Prerequisites: take INMGT-200, and take STAT-130 or STAT-320.

INMGT-310 Production Processing (3 cr.)
Fall and Spring
Production processes, especially product design as related to economic production; factors that influence choice and sequence of process to obtain end product. Prerequisites: take INMGT-200.

INMGT-314 Industrial Enterprise Practicum (3 cr.)
Fall, Spring and Summer
Organization and operation of an industrial company; election, designing, production planning, production, marketing and distribution of a product.

INMGT-320 Quality Tools (3 cr.)
Fall, Spring and Summer
Practical and statistical quality control in design and use of quality assurance programs: quality engineering, manufacturing quality assurance and product quality assurance.
Prerequisites: take STAT-130.

INMGT-325 Quality Management (3 cr.)
Fall, Spring and Summer
Provides the managerial and technical knowledge necessary to prepare, document, manage, and evaluate quality systems from beginning design through system operation and post-delivery customer services within a product or service environment.
Prerequisites: take INMGT-200 or INMGT-210 or INMGT-335.

INMGT-335 Lean Manufacturing Systems (4 cr.)
Fall
Introduction to production/operations management and lean manufacturing system design for engineers. Emphasis is given to analysis and design of production systems, facility layout, and globalization. Prerequisites: take STAT-330.

INMGT-350 Facilities Planning (3 cr.)
Spring
Study of facilities location, structure, and planning for efficient layout and material handling systems. Prerequisites: take INMGT-200.

INMGT-365 Project Management (3 cr.)
Fall, Spring and Summer
Planning, scheduling, and control of technical projects. Topics covered include activity

identification, network diagrams, scheduling, PERT/CPM, cost analysis, resource management, and computer control.

INMGT-370 Industrial Management Issues Seminar (2 cr.)
Fall and Spring
Current and emerging trends and issues in industrial management for students with a technical background who are preparing and planning for a career in leadership and management positions. 12 earned UW-Stout credits.

INMGT-400 Organizational Leadership (3 cr.)
ESC Fall, Spring and Summer
Overview of the leader's role in accomplishing organizational objectives through the management of human resources. Concepts of organizational and individual behavior serve as a foundation for the development of such leadership skills as communication, motivation, initiating change, team building, delegation, building credibility, and conflict management. Senior level or
higher.

INMGT-401 Management Consulting (2 cr.)
Summer
The organization and analysis of major elements of the consulting profession in management: 1) subject matter expertise, 2) marketing, 3) organizational development, 4) business principles for consultants and 5) communication skills; synthesis of the interdependent relationship of the major elements in the consultation process.

INMGT-403 Leadership Praxis (1 cr.)
Synthesis of Leadership skills/characteristics, leading to understanding of integrative leadership, and including increased capacity for civic engagement, social justice action, and ethical decision-making.
Prerequisites: Take INMGT-303

INMGT-405 Resource Planning and Materials Management Practicum (3 cr.)
Fall and Spring
Provides students with specific skills in managerial techniques for planning, scheduling and controlling resources in manufacturing and service organizations. Focuses on the first two of the five required APICS exams that lead to certification as a Certified in Production and Inventory Manager (CPIM).
Prerequisites: take INMGT-305.

INMGT-410 Six Sigma Quality Improvement Methods (3 cr.)
Fall and Spring
Overview of Six Sigma quality improvement applications. Application of scientific methods to improve quality of products, service, processes, and management systems.
Prerequisites: take INMGT-320, INMGT-325.

INMGT-414 Leadership Practicum (1 cr.)
Practical application of leadership principles in an enterprise.
Prerequisites: Concurrent enrollment in INMGT-314, consent of instructor.

INMGT-415 Inclusivity in Leadership (3 cr.)
ESB Winterm
An examination of leadership dynamics for, but not limited to, women, people of color and

other underrepresented populations including approaches to leading, communicating, and developing inclusive organizations. Prerequisites: take 1 option: take SOC-110 and INMGT-400, or take SOC-110 and BUMGT-304.

INMGT-416 People Process Culture (3 cr.)
Fall and Spring
A study of high performing people process culture organizations integrating sociology, applied psychology, and organization behavior subject matter areas.
Prerequisites: take BUMGT-304, and take PSYC-382 or INMGT-400.

INMGT-420 Quality Assurance – Practicum (3 cr.)
Fall and Spring
Application of principles and techniques learned in INMGT-320, as part of professional semester/ manufacturing laboratory. Prerequisites: take INMGT-320, INMGT-325.

INMGT-422 Quality Engineering (3 cr.)
Fall and Spring
Practical and statistical engineering methods to improve quality and design in a manufacturing environment.
Prerequisites: take INMGT-200, STAT-330; minimum grade C.

INMGT-425 Planned Experimentation for Quality Improvement (3 cr.)
Fall
Quality improvement through planned experimentation that focuses on product realization activities which consist of new product design and formulation, manufacturing process development and improvement.
Prerequisites: take INMGT-422.

INMGT-430 Employee Involvements: Work Teams (2 cr.)
Summer
Background and history of employee involvement, teams as a method of employee involvement, analysis of the advantages and disadvantages of different team structures and the planning processes used to implement team structures, analysis of situational variables used to help design the best team approach for an organization, the support systems needed to maintain teams, phases of team development, facilitation skills, and team problem-solving methods. Senior level or
higher.

INMGT-440 Lean Enterprise (3 cr.)
Fall and Spring
Principles of lean techniques, justification of lean systems, how lean systems are scheduled, and cost analysis of a lean environment.
Prerequisites: INMGT-200

INMGT-450 Maintenance Management (3 cr.)
Fall
Organization and management of fixed asset maintenance systems including organizational structures, work control systems, computerized maintenance management systems, preventative and predictive maintenance, energy systems analysis and human resource utilization.

INMGT-460 Industrial Management Capstone (3 cr.)

Summer
Principles and methods of analyzing and solving industrial problems; application through case studies, management games and special problems. Emphasis on emerging techniques and issues in industry. Senior level or higher.

INMGT-462 Global Manufacturing Study Tour (2-3 cr.)
GLP Summer
Visit global sites to understand the current state of product design, manufacturing, and distribution in both developed and developing countries. Learn how to develop supplier, manufacturing, and distribution systems in a global setting. Senior Level Or Higher.

INMGT-475 Advanced Project Management (3 cr.)
Fall and Spring
Advanced planning, control, and leadership of technical projects and programs. Topics covered include: project and program justification, project management maturity and methods, multiple project or portfolio management, project management in multinational cultures, virtual project teams, requirements definition, and outsourcing.
Prerequisites: take INMGT-365.

INMGT-480 Production Systems Planning (2 cr.)
Fall and Spring
Plan of manufacturing systems utilizing contemporary techniques, such as: employee involvement, value analysis, compatibility with facilities and equipment, reliability, material requirements, scheduling, and risk control. Prerequisites: take INMGT-422.

INMGT-489 Business and Industrial Intern (1-8 cr.)
Fall, Spring and Summer
Off-campus work and study in student's area of concentration; approved salaried position with cooperating company for a semester or summer session. Junior level or higher. **R**

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ITM Information Technology Management

ITM-133 Networking Fundamentals I (3 cr.)
Internet protocol addressing; routing and switching fundamentals.

ITM-134 Networking Fundamentals II (3 cr.)
Advanced addressing, switched networks, routing protocols, access lists and wide area networks. Prerequisites: take ITM-133.

ITM-300 Workshop (1-3 cr.)
Fall, Spring and Summer
Special topics in graphic communications, providing hands on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

ITM-308 Convergence Technologies (3 cr.)
Spring
Creation of single networks that support many different types of traffic: data, audio, video, and interactive multimedia. Planning physical design and installation of a telephone and converged system, requirements of a converged network, and what makes convergence.
Prerequisites: take ICT-103.

ITM-330 IP Telephony Design and Implementation (3 cr.)
Internet Protocol (IP) Telephony components and protocols examination; converged network interpretation; analog and digital voice interface configuration; quality of service configuration; single and multi-site IP telephony deployment; IP telephony features implementation.
Prerequisites: take ITM-441.

ITM-340 Cisco Networking Academy Program: Instructor Fast Track (2 cr.)
Summer
Fast-track option to prepare the instructor for teaching in the Cisco Networking Academic Program, meeting requirements for the Cisco Certified Academic Instructor (CCAI). Instructor's consent required. Must be Cisco CCNA certified.

ITM-341 Cisco Networking Academy Program: Instructor I (4 cr.)
First in a four-course sequence preparing instructors for teaching in the Cisco Networking Academy Program, meeting requirements for the Cisco Certified Academic Instructor (CCAI), and preparing for the Cisco Certified Network Associate (CCNA) examination.
Instructor's consent required.

ITM-342 Cisco Networking Academy Program: Instructor II (3 cr.)
Second in a four-course sequence preparing instructors for teaching in the Cisco Networking Academy Program, meeting requirements for the Cisco Certified Academic Instructor (CCAI), and preparing for the Cisco Certified Network Associate (CCNA) examination.
Prerequisites: take ITM-341.

ITM-343 Cisco Networking Academy Program: Instructor III (2 cr.)
Third in a four-course sequence preparing instructors for teaching in the Cisco Networking Academy Program, meeting requirements for the Cisco Certified Academic Instructor (CCAI), and preparing for the Cisco Certified Network Associate (CCNA) examination.
Prerequisites: take ITM-342.

ITM-344 Cisco Networking Academy Program: Instructor IV (2 cr.)
Fourth in a four-course sequence preparing instructors for teaching in the Cisco Networking Academy Program, meeting requirements for the Cisco Certified Academic Instructor (CCAI), and preparing for the Cisco Certified Network Associate (CCNA) examination.
Prerequisites: take ITM-343.

ITM-361 Workstation and Server (3 cr.)
Installing, configuring, and administering Microsoft Windows utilizing the current commercial version of the product for both workstations and servers. Helps prepare students for two of the Microsoft Certified Systems Engineer (MCSE) certification examinations.

ITM-362 Server Applications (3 cr.)
Summer
Installing, configuring, and administering server applications using multiple industry standard operating systems. Server applications may include World Wide Web, FTP, software updates, mail, file sharing, DNS, DHCP, and terminal services.
Prerequisites: take ITM-361.

ITM-363 Directory Services (3 cr.)
Summer
Provides knowledge and skills to plan, implement, and troubleshoot directory services. Design and implement a secure network. Focuses on a directory services environment, including forest and domain structure, domain name system, site topology and replication, organizational unit structure, and delegation of administrations.
Prerequisites: take ITM-361.

ITM-382 Network Systems Design (3 cr.)
Spring
Concepts from communication networks. LAN, MAN, WAN networks. Introduction to LAN switching, ATM and virtual LANS. Designing and integration of LAN switching virtual networking and ATM into today's networks. Telecommunication Systems or Information Technology Management majors only.

ITM-383 Introduction To Network Security (3 cr.)
Winterm, Summer
Design, implementation and management of network security in multilayered computer networks. Identifying and evaluating network security threats; internet, intranet, and extranet security issues. Must be Cisco CCNA certified.

ITM-391 Wireless Systems (3 cr.)
Spring
Wireless networking combining Radio Frequency (RF) and Local Area Networking (LAN) technology fundamentals. Basic concepts and building blocks or the convergence between

RF and networking technologies. Technologies and tasks vital to installing, managing, and supporting wireless networks.

ITM-441 Scalable Internetworks (3 cr.)
One of three core courses for preparation for the Cisco CCNP and CCDP professional certification. Students will learn how to build scalable routable networks. Students are required to pass the associated Cisco certification examination. Must be Cisco CCNA certified.

ITM-442 Remote Access Networks (3 cr.)
Fall and Spring
One of three core courses for preparation for the Cisco CCNP and CCDP professional certification. Students will learn how to build remote access networks to interconnect central sites to branch offices and home offices. Students are required to pass the associated Cisco certification examination.
Prerequisites: take ITM-441.

ITM-443 Multi-Layer Switched Networks (3 cr.)
Fall and Spring
One of three core courses for preparation for the Cisco CCNP and CCDP professional certification. Build multi-layer switched networks. Students are required to pass the associated Cisco certification examination.
Prerequisites: take ITM-441.

ITM-444 Internetwork Troubleshooting (3 cr.)
Fall and Spring
Specialization course for the Cisco CCNP professional certification. Students will learn to troubleshoot internetworks. Students are required to pass the associated Cisco certification examination.
Prerequisites: take ITM-441, ITM-442 and ITM-443.

ITM-445 Internetwork Design (3 cr.)
Fall and Spring
Specialization course for the Cisco CCNP professional certification. Students will learn to design internetwork solutions. Students are required to pass the associated Cisco certification examination.
Prerequisites: take ITM-441, ITM-442 and ITM-443.

ITM-450 Enterprise Solutions and Unified Communications (3 cr.)
Enterprise-level network utilizing the technologies and methods that are current industry best practices. Provide enterprise network solutions and unified communications to and organization while maintaining quality of service. New and emerging network technologies for an enterprise network.
Prerequisites: take ITM-330, ITM-363, and ITM-444.

ITM-481 Telecommunications Systems Administration (3 cr.)
Fall
Issues and concerns required to manage telecommunications networks and contemporary problems.

ITM-484 Advanced Network Security and Auditing (3 cr.)

Network infrastructure, operating systems, data centers, and virtualized environment security and auditing. Information technology government and industry regulation compliance.
Prerequisites: ITM-363, ITM-383, ITM-443

ITM-490 Information Technology Management Capstone (3 cr.)
Fall and Spring
Work with an outside organization in a team environment utilizing concepts of design, brainstorming, problem solving, team work, creativity, evaluation, and present findings in oral and written formats.
Prerequisites: take ITM-444

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LIT Literature

LIT-203 American Poets (3 cr.)
HUM/LIT ESB
Contemporary American writers of narrative, dramatic and lyric poetry.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-205 The Short Story (3 cr.)
HUM/LIT Fall
Style, structure, history and development of short story as a literary form.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-208 Fiction Into Film (3 cr.)
HUM/LIT ESC Fall and Spring
Selected works of literature and their film adaptations. Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-230 American Cinema (3 cr.)
HUM/LIT ESB
A literary and cultural examination of the development of cinema in the United States with special attention to the evolution of the cinematic treatment of non-dominant cultural groups.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-255 Recent World Literature (3 cr.)
HUM/LIT GLP
Selected readings in Contemporary Literature in Translation.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-260 Modern American Literature (3 cr.)
HUM/LIT ESB
Fall, Spring and Summer
Selected poetry, prose and drama produced since World War I.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-272 Women Writers (3 cr.)
HUM/LIT GLP ESB Fall
Study of representative American and international women writers within the tradition of feminist literary theory.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-273 American Multicultural Literature (3 cr.)
HUM/LIT ESA Fall, Spring and Summer
American multicultural literature, focusing on Hispanic, African, Asian, and Native American writers.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-275 Environmental Literature (3 cr.)
HUM/LIT ESB
Literary and critical analysis of environmentalist discourses. Exploration of literary works that treat land use and co-existence among life forms.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-280 Best-Sellers (3 cr.)
HUM/LIT Fall and Spring
Fiction and non-fiction best-sellers: expression of and impact on popular culture.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-281 Recent American Literature (3 cr.)
HUM/LIT ESB Spring
American poetry, fiction and drama since 1950.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-285 Science Fiction (3 cr.)
HUM/LIT
Critical survey of popular and classic science fiction.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-300 Children's Literature (3 cr.)
HUM/LIT ESB
Fall and Spring
Critical survey and ways of presenting literature for children from infancy to age 12.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-301 English Literature (3 cr.)
HUM/LIT Spring
Selected prose and poetry from 1798 to modern times.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-302 Topics in Literature (1 cr.)
HUM/LIT
Intensive analysis of selected authors and literary works with emphasis on discourse analysis in group and workshop settings.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113. **R**

LIT-303 Coming of Age in Literature and Film (3 cr.)
HUM/LIT ESB Fall, Spring and Summer
Exploration of literary and filmic works that treat age, coming of age, aging, and old age, including texts from American majority and minority cultures. Literary and critical analysis using age studies in literature.
Prerequisites: take ENGL-102 or ENGL-112.

LIT-304 American Folklore (3 cr.)
HUM/LIT ESB Fall and Spring
Analysis and interpretation of stories, songs, jokes, and material culture of families, work groups, ethnic groups, and religious groups.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-306 Shakespeare (3 cr.)
HUM/LIT Spring
Several representative plays and selected criticism.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-350 Modern British Literature (3 cr.)
HUM/LIT GLP
Fall and Spring
Selected poetry, prose, and fiction produced since World War I.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113.

LIT-450 Studies in Literature (theme, Author, Genre) (2-3 cr.)
HUM/LIT Fall and Spring
A study of a selected writer's work or of literature focusing on a significant theme of literature or of a genre not offered as a distinct course of similar duration within the departmental curriculum.
Prerequisites: take ENGL-102 ENGL-112 or ENGL-113. **R**

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LOG Logic

LOG-250 Critical Thinking 3 cr.
Fall, Spring and Summer
Formulation, clarification and critical evaluation of claims: justification through non-formal argumentational strategies.

LOG-301 Introduction to Logical Thinking 3 cr.
ANRSN LOGIC Fall and Spring Semesters
Problem-solving strategies based on induction and on categorical and propositional deduction.

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MATH Mathematics

MATH-010 Fundamentals of Algebra 2 cr.
Fall and Spring
Review of fundamental principles of elementary algebra. Credit earned for MATH-010 will not count toward graduation.

MATH-110 Intermediate Algebra 4 cr.
Fall, Spring and Summer
Basic algebraic skills: factoring, exponents, rational expressions, linear equations and inequalities, systems of equations, quadratic equations, and an introduction to functions. One year of high school algebra and math placement test is required, or MATH-010.

MATH-118 Concepts of Mathematics 4 cr.
ANRSN MATH Fall, Spring and Summer
Elementary concepts in mathematical language and reasoning, sets, number systems and theory, algebraic equations, statistics and probability, geometry, computers; historical survey. One year of high school algebra and math placement test required, or Math-010.

MATH-120 Introductory College Mathematics I 4 cr.
ANRSN MATH
Fall, Spring and Summer
Review of basic algebra, solving equations and inequalities, applications of equations and inequalities, functions and their graphs, polynomial equations, and systems of equations. Math placement test required, or MATH-110.

MATH-121 Introductory College Mathematics II 4 cr.
ANRSN MATH
Fall, Spring and Summer
Continuation of MATH-120. Study of functions to include rational, exponential, logarithmic, and trigonometric functions and two dimensional analytic geometry. Math placement test required or MATH-120.

MATH-123 Finite Mathematics With Applications 4 cr.
ANRSN MATH
Fall, Spring and Summer
Real number system, systems of linear equations and inequalities, sets, functions, vectors, matrices, probability, linear programming, theory of games, Markov chains. Math placement test required, or MATH-110 or MATH-120.

MATH-153 Calculus I 4 cr.
ANRSN MATH
Fall, Spring and Summer
Functions, limits, continuity, bounds, sets; the derivative of functions and applications; exponential, logarithmic, trigonometric and inverse functions. Not open to those with credit in MATH-154, MATH-156, MATH-157 or MATH-158. Math placement test score of 4

or higher, or Math-121.

MATH-154 Calculus II 4 cr.
GE ANRSN MATH
Fall and Spring
Continuation of MATH-153: antiderivatives; integration theory and techniques, applications; parametric equations, vectors.
Prerequisites: take MATH-153 or MATH-156.

MATH-156 Calculus and Analytic Geometry I 5 cr.
GE ANRSN MATH
Fall and Spring
Review of real numbers, inequalities, absolute values, intervals and continuity; analytic geometry of the plane, limit concepts, derivatives of algebraic functions, definite integral.
Math placement test score of 4 or higher, or MATH-121.

MATH-157 Calculus and Analytic Geometry II 5 cr.
GE ANRSN MATH
Fall and Spring
Application of derivative and definite integral; conic sections and other algebraic curves; calculus for rational, algebraic, circular, exponential and trigonometric functions; formal integration.
Prerequisites: take MATH-153 or MATH-156.

MATH-158 Calculus III 3 cr.
Fall and Spring
Formal integration continued; parametric equations, polar representation, Cauchy's formula, Taylor's theorem, infinite series, vectors, partial differentiation, multiple integration.
Prerequisites: take MATH-154 or MATH-157.

MATH-180 Foundations of the Language of Mathematics 4 cr.
Conceptual foundations of mathematics and the language of mathematics. Logical rules of inference, statement forms, methods of proof, universal and existential quantifiers, abstraction and definition, set theory, relations, functions and cardinality. Proofs involving the above concepts and applications of the conepts and methods of proof to particular abstract mathematical objects.
Prerequisites: take MATH-153 or MATH-156.

MATH-250 Differential Equations With Linear Algebra 3 cr.
Fall and Spring
Differential equations: first-order and higher-order equations, systems of linear differential equations. Linear algebra: matrices, determinants, systems of linear equations, vector spaces, linear transformations, eigenvalues, eigenvectors.
Prerequisites: take MATH-154 or MATH-157.

MATH-255 Differential Equations 3 cr.
Spring
Common types of ordinary differential equations of first and second order; linear equations with constant coefficients; series solutions, numerical approximations, systems of ordinary equations.
Prerequisites: take MATH-154 or MATH-157; and take MATH-275.

MATH-262 Modern Geometry 3 cr.
Spring
Development of logical discourse, betweenness properties and plane separation, geometric models of axiomatic systems, modern geometry of triangle and circle, transformations (linear, circular), orthogonal systems of circles, elliptic and hyperbolic geometry.
Prerequisites: take MATH-153 or MATH-156.

MATH-270 Discrete Mathematics 3 cr.
Exploration of sets, relations, functions, formal logic, proof techniques, counting techniques, graphs, recurrence relations, and generating functions. Applications in mathematics and computer science.
Prerequisites: take MATH-153 or MATH-156.

MATH-275 Linear Algebra 3 cr.
Fall and Spring
Algebra of linear transformations and matrices. Determinants, equivalence relations, rank systems of equations, vector spaces, orthogonal transformations, characteristic equations and quadratic forms.
Prerequisites: take MATH-153 or MATH-156.

MATH-350 Vector Analysis 3 cr.
Fall, Spring and Summer
Basic theory of vectors. Vector differential calculus and vector integral calculus of two and three dimensions with applications.
Prerequisites: take MATH-158.

MATH-370 Modern Algebra I 3 cr.
Fall
Set theory, mappings, equivalence relations and classes, mathematical induction, Peano's postulates, isomorphisms; development of natural numbers, integers, rational, and real numbers; introduction to integral domains and rings.
Prerequisites: take MATH-154 and MATH-275 or MATH-157 and MATH-275.

MATH-371 Modern Algebra II 3 cr.
Spring
Continuation of MATH-370; rings, integral domains, fields, polynomials, groups, vector spaces; introduction to algegra of matrices.
Prerequisites: take MATH-370.

MATH-380 Cryptography 3 cr.
Spring
Classical, public-key and symmetric-key cryptosystems. Basic number theory. Digital signature schemes. Applications to information assurance and cyber security.
Prerequisites: take MATH-370.

MATH-450 Real Analysis I 3 cr.
Fall Semester
Rigorous development of advanced topics in analysis; functions, real numbers, sequences, Cartesian spaces, sequences of functions, limit superior and inferior, continuous functions.
Prerequisites: take MATH-154 or MATH-157.

MATH-451 Real Analysis II 3 cr.

Spring
Continuation of MATH-450; differentiation, integration, infinite series.
Prerequisites: take MATH-450.

MATH-460 Complex Variables With Applications 3 cr.
Spring
Complex numbers, analytic functions, elementary functions of complex variables, mapping of elementary functions, integration techniques, power series and calculus of residues.
Prerequisites: take MATH-158.

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MBE Marketing & Business Education

MBE-101 Introduction to Marketing and Business Education (3 cr.)
Fall and Spring
Becoming a teacher in the disciplines of Marketing and Business Education (MBE) within K-12 schools, technical college, community colleges, and adult programs.

MBE-X49 Cooperative Education / Internship (1-8 cr.)
Work and study in an approved area of marketing education. May be recurring. Supervised during work/study periods. Recurring experiences would be designed to build upon previous experiences in the course. **R**

MBE-202 Supervision of Marketing and Business Education Career and Technical Student Organizations (3 cr.)
Fall
Competencies needed to become a successful advisor, integrate a marketing and/or business education career and technical student organization into curriculum with a focus on the high school division of BPA, FBLA, and DECA.

MBE-300 Introduction to Teaching Marketing and Business Education (3 cr.)
A study of becoming a teacher in the disciplines of Marketing and Business Education with a deep focus on their related career and technical student organizations.

MBE-301 Methods and Strategies for Teaching Marketing (4 cr.)
Fall
Marketing content structures, teaching and learning strategies and aids. Benchmark I Completed. Prerequisites: take EDUC-303.

MBE-311 Marketing and Business Education Project Method (2 cr.)
Fall
Project method of instruction in a career and technical education program. Concurrent enrollment in MBE-312 is required. Benchmark I Completed. Prerequisites: take MBE-101. Corequisite courses: MBE-312.

MBE-312 Marketing and Business Education Pre-Student Teaching (1 cr.)
Fall
Design and deliver lessons at a PK-12 school district in conjunction with MBE-311. Benchmark I Completed. Prerequisites: take MBE-101. Corequisite courses: MBE-311.

MBE-355 Marketing and Business Seminar (3 cr.)
Spring
Issues and trends in marketing, business and career and technical education. Experiences necessary for success during student teaching and upon initial career entry. . **R**

MBE-401 Marketing Education Curriculum (2-3 cr.)
Fall

Program, course and lesson-level curriculum develpoment skills. Assessment systems, strategies, design elements, and test development skills. Benchmark I Completed. Prerequisites: take MBE-301, MBE-311, and MBE-312.

MBE-409 Marketing Education -- Student Teaching (2 -16 cr.)
Fall and Spring
Directed teaching and community experiences in selected off-campus schools. Benchmark II Completion. Prerequisites: take MBE-401.

MBE-411 Business Education Methods and Curriculum (5 cr.)
Spring
Teaching methods and curriculum design for business educators. Emphasis on basic business subjects; business literacy and entry-level job preparation; issues and trends; demonstration and development of a standards-based business education curriculum. Benchmark I Completed.

MBE-412 Elementary Keyboarding Teaching Methods (1 cr.)
Summer
Developmentally appropriate methods of instruction in keyboarding and emerging input technologies applicable to elementary educational settings.

MBE-419 Business Education Student Teaching (2-8 cr.)
Fall and Spring
Directed teaching and community experiences in selected off-campus schools. Benchmark II Completion. Prerequisites: take MBE-411.

MBE-488 Marketing Education -- Internship (8-16 cr.)
Fall and Spring
Directed teaching and community experiences in selected off-campus schools. Benchmark II Completion. Prerequisites: take MBE-401.

MBE-489 Business Education Internship (8 -16 cr.)
Fall and Spring
Directed teaching and community experiences in selected off-campus schools. Benchmark II Completion.

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E

MECH Engineering Mechanics

MECH-290 Mechanics of Solids I 3 cr.
Technical calculations, dimensional analysis, freebody diagrams, force systems and equilibrium, friction, elementary statically determinate framed structures, and simple stress.
Prerequisites: take PHYS-231, PHYS-241 or PHYS-281.

MECH-291 Mechanics of Solids II 3 cr.
Stress and strain, torsion, bending of beams, compound stress, principal stress, deflection of beams, statically indeterminate members and columns.
Prerequisites: take MECH-290 or PHYS-331.

MECH-293 Engineering Mechanics 3 cr.
Force systems and equilibrium in two and three dimensions, free body diagrams, trusses, frames, friction, kinematic analysis of particle and rigid body translation, rotation, and general plane motion, force-acceleration analysis, work-energy analysis, impulse momentum analysis, impact, damped and undamped vibrations, and forced vibrations.
Prerequisites: take PHYS-281.

MECH-294 Mechanics of Materials 3 cr.
Stress and strain, stress-strain curves, material properties, stress and strain transformation, axially loaded members, elastic and inelastic flexure, shear and bending moment diagrams, beam deflections, combined loading, fatigue, column buckling.
Prerequisites: take MECH-293.

MECH-298 Field Experience 1-2 cr.

MECH-332 Mechanical Design 4 cr.
Analysis and design of machine elements: gearing bearings, shafting and friction devices.
Prerequisites: take MECH-290 and MECH-291.

MECH-337 Mechanical Design Practicum 3 cr.
Practical application of mechanical design in a team project. Creativity, documentation standards, design for manufacturability, design analysis, team dynamics, communication skills, and finite element analysis are applied to an industrial standard in the design of a machine,system, or product.
Prerequisites: take ENGGR-210 and ENGGR-280 and MECH-332.

MECH-392 Mechanics of Machinery I 3 cr.
Dynamics of machinery: rectilinear and curvilinear motion; translation and rotation of a rigid body, force-acceleration equation, impulse and momentum; work, power and energy; balancing and vibration.
Prerequisites: take MECH-290 or PHYS-331; and take MATH-153.

MECH-393 Mechanics of Machinery II 3 cr.
Graphical analysis and synthesis of linkages, cams, gear trains, displacement, velocity, acceleration and dynamic forces.

MECH-398 Field Experience 1-2 cr.

MECH-437 Mechanical Design Lab 3 cr.
An experimental study in the design of electro-mechanical systems. Design, functional prototype construction, experimentation and validation of systems are emphasized. Prerequisites: take MECH-337 and ELEC-341.

MECH-498 Field Experience 1-2 cr.

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MEDIA Media Technology

MEDIA-204 Exploring Photography (3 cr.)
HUM CRPRF
Fundamentals of analog and digital photography with an emphasis on technical processes, principles of composition, aesthetics and paradigms of visual literacy. Students must provide a digital camera with a manually adjustable shutter and aperture.

MEDIA-305 Photo Processes (3 cr.)
Fall, Spring and Summer
Advanced monochromatic photography: aesthetics, advanced theory, view-camera techniques, studio lighting, materials and equipment selection, sheet-film processing, specialized processes and techniques.
Prerequisites: take MEDIA-204. **$**

MEDIA-311 Advertising and Public Relations Photography (3 cr.)
Fall, Spring and Summer
A survey of advertising and public relations photography trends and practices. The relationship between photography, typography and design, image capture, manipulation, file management, workflow, output, as wells as identifying and meeting client needs and expectations are stressed. A digital SLR camera is required.
Prerequisites: take MEDIA-204.

MEDIA-330 Video Production (3 cr.)
Fall and Summer
A survey of digital audio and video production fundamentals with emphasis on workflow, digital capture, editing and manipulation and delivery alternatives.

MEDIA-335 Film-History and Appreciation (3 cr.)
Fall
Evolution of motion picture film as medium of mass communication and aesthetic expression; contributions of noted film producers.

MEDIA-340 History of Photography (3 cr.)
Spring
A survey of the scientific and aesthetic development of photography from its beginnings to the recent practices of photographic technologies in the context of post-modernity. This course will examine the diversity of styles, techniques, methods, and ideologies of selected photographers focusing on their contributions and influences in advertising, art, fashion, communication technology and pop culture.

MEDIA-360 Introduction To Media in Education and Training (2 cr.)
Fall, Spring and Summer
Use of media in education and training. Includes the production of media and instructional materials in print, video, computer-bases and multimedia formats.

MEDIA-365 Integrated Software Applications For Instruction (3 cr.)
Spring and Summer
Software applications for the professional and personal use of instructors. The effective use of word processing, spreadsheet, database, presentation, communication and other appropriate software applications with emphasis on curricular integration and professional standards.
Prerequisites: take ICT-103.

MEDIA-366 Integrated Media Applications For Instruction (3 cr.)
Prepares instructors to use various media in the learning environment. Emphasis on proper curriculum integration based on sound curriculum design principles and professional standards. Instructor's consent required. Prerequisites: take MEDIA-365.

MEDIA-370 Computer-Assisted Interactive Video (3 cr.)
Summer
Design, production and evaluation of interactive video applications. Analysis of various hardware and software systems. Instructor's consent required.

MEDIA-375 Web Production and Distribution (3 cr.)
Fall, Spring and Summer
Production and distribution of content to the World Wide Web (WWW). Consideration given to importance, types and purposes, advantages and disadvantages, production and distribution workflow, planning, use of various media elements and technologies for web production and distribution.
Prerequisites: ICT-103 or GCM-151.

MEDIA-400 Workshop (1-3 cr.)
Fall, Spring and Summer
Special topics in media technology providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

MEDIA-411 Photojournalism and Documentary Photography (3 cr.)
Fall
A survey of photojournalism and documentary trends and practices for editorial publication. The importance of the still photograph as a conveyor of information and influence on public opinion is emphasized. Ethical and moral considerations, freedom of press and the public's right to know are stressed. A digital SLR camera is required.
Prerequisites: take MEDIA-204.

MEDIA-412 Nature Photography(3 cr.)
Fall, Spring and Summer
Fundamentals of conventional and digital photography, camera techniques, composition, aesthetics, exposure, and light in relation to animals, plants, water, weather and landscapes. Emphasis on appropriate photographic equipment and field techniques for nature photography. Student must provide an adjustable camera.
Prerequisites: take MEDIA-204. **$**

MEDIA-414 Slide Duplication and Copystand Techniques (1 cr.)
Summer
Selection and use of equipment for copystand work and slide duplication; discussion of and practice with filters and multiple exposures.
Prerequisites: take MEDIA-204.

MEDIA-430 Video/Cinema Practicum (3 cr.)
Spring
Cross discipline teams explore selected topic(s) through the completion of professional level video/cinema project(s), from concept to distribution digital media.
Prerequisites: take PHOTO-330.

MEDIA-440 Telecommunication Systems and Teleconferencing (2 cr.)
Fall, Spring and Summer
Interactive teleconferencing techniques. Applications, effective utilization and cost-effectiveness of information distribution systems, including telephone, television, teletext, videotest, viewdata, cable TV, slow-scan TV, and computers. Survey of transmission systems, including telephone lines, satellites, coaxial cable, microwave and fiber optics.

MEDIA-441 Fashion and Glamour Photography (3 cr.)
Spring
A survey of fashion and glamour photography trends and practices for advertising and editorial publication. Emphasis is placed on studio and location lighting, working with models, hair and make-up artists as wells as wardrobe and prop stylists. The importance of concept and design in creating effective images is stressed.
Prerequisites: take MEDIA-204.

MEDIA-451 Product Photography (3 cr.)
Fall, Spring and Summer
Photography of natural and manufactured products for illustration, documentation, catalog and aesthetic purposes. Studio and field shooting, lighting for various product characteristics and locations, markets and market requirements, photographer-client relations, legal issues. 35mm single lens reflex, medium format, view or adjustable digital (3 megapixel minimum) camera required.
Prerequisites: take MEDIA-204.

MEDIA-495 Professional Portfolio Development (3 cr.)
Spring
Capstone experience for the Applied Photography minor. Students fine tune their direction and concentrate on the area they intend to specialize in their professional career. Students design and produce a portfolio to be evaluated by representative professionals. Standards of professional practice are emphasized. 18 MEDIA credits.

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MFGE Manufacturing Engineering

MFGE-106 Impacts of Engineering Design (2 cr.)
TECH GLP
Investigation and exploration into past and present practices of engineering design and the resulting impacts on people, society, and the environment.

MFGE-275 Thermodynamics and Heat Transfer (2 cr.)
Application of thermodynamics and heat transfer fundamentals to the design and analysis of manufacturing processes and systems.
Prerequisites: take PHYS-281 and MATH-250.
Corequisite course: MATH-250.

MFGE-325 Computer Aided Manufacturing for Manufacturing Engineers (3 cr.)
Effects of product mix and demand patterns on manufacturing system design and selection of process control methods. Introduction to quick changeover strategies and reprogrammable automation including numerically controlled machine tools, robotics, group technology, CAD/CAM, automated inspection and other computerized processing techniques.
Prerequisites: take MFGT-252 and ENGGR-210.

MFGE-351 Manufacturing Process Engineering I (3 cr.)
Understanding, analysis, and control of machining and metal forming processes. Emphasis is given to process characteristics of heat transfer, process forces and pressures, and machine tool dynamics. Sheet metal designs utilizing solid modeling software.
Prerequisites: take CHEM-341, MECH-294, MFGT-252, MFGE-275 and STAT-330.

MFGE-352 Manufacturing Process Engineering II (3 cr.)
Analysis of polymer and metal behavior in processing; mechanics of processing; identification of appropriate fabrication processes; diagnosis of process related problems; mathematical modeling of process designs.
Prerequisites: take MFGT-251, MFGT-253, MECH-294, MFGE-275 and STAT-330.

MFGE-363 Controls and Instrumentation (4 cr.)
Programmable logic controllers, structured ladder logic developments, input/output module description, and interfacing with analog and digital sensors and actuators. Motion, temperature, pressure and flow sensors. Advantages of closed loop control, mathematical modeling of electric and mechanical systems, stability analysis and frequency response. Introduction to motion control.
Prerequisites: take ELEC-290 and MATH-250, both with C or better.

MFGE-391 Fluid Mechanics (2 cr.)
Fundamental fluid mechanics is presented. Fluid power components and measurement systems are presented. Fluid power systems are mathematically modeled. Fluid power circuits and circuit schematics are designed and analyzed. Fluid power dynamic behavior, in general terms, is discussed.

Prerequisite: take MFGE-363.

MFGE-395 Seminar (1-2 cr.)
Title will reflect specific manufacturing content.

MFGE-400 Workshop (1-3 cr.) Special topics in manufacturing, providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

MFGE-405 Capstone I: Concurrent Design (3 cr.)
Concurrent product design and development. Concept of design; brainstorming, problem solving, and creativity methods. Engineering methods. Design analysis, solid modeling, finite element analysis and information sources. Development of teamwork and communications skills. Consideration of cell needs and limitations.
Prerequisites: take MFGE-351 and MFGE-352; corequisite: MFGE-441.

MFGE-410 Capstone II: Manufacturing System Design (3 cr.)
Dedicated and flexible manufacturing systems through the design, building and testing of a flexible manufacturing cell that produces a discrete family of parts, design of part transfer, tooling, sensing, production control and integrated inspection systems will be emphasized.
Prerequisite: take MFGE-325, MFGE-405, MFGE-415 and MFGE-391.

MFGE-415 Machine Vision and Robotics (2 cr.) Design of machine vision and industrial robotic applications, including cost justification.
Prerequisites: take INMGT-300 and MECH-293.

MFGE-440 Manufacturing System Design and Simulation (3 cr.)
Design of manufacturing systems using contemporary methods and philosophies. Modeling and comparison of system designs using simulation software. Interpretation of experimental simulation results to evaluate system design alternatives. Preparation of technical reports summarizing projects.
Prerequisites: take STAT-330 and INMGT-335 (may be concurrent).

MFGE-441 Design of Jigs, Fixtures, and Tooling (3 cr.)
Design of tooling used for machining, locating and transferring multiple parts for fixed and flexible manufacturing. Design, setup and development of tooling for robots, computer numerical control machines and other production equipment. Transfer line tooling.
Prerequisites: take MFGT-252, ENGGR-210 and MECH-294.

MFGE-465 Reliability Engineering (3 cr.)
A practical introduction to reliability engineering with the opportunity for application. Topics covered include reliability need, calculations, prediction and modeling, and test design.
Prerequisites: take STAT-330.

MFGE-490 Manufacturing System Design Problems (1-3 cr.)
Manufacturing system design through the application of previously learned principles and techniques. Issues to be addressed include: product design for manufacturability, process and tooling design and fabrication, system layout and equipment configuration, information and control architecture, implementation of quick-changeover strategies, task sequencing and scheduling, and simulation and evaluation of alternatives.

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MFGT Manufacturing Technology

MFGT-110 Materials and Manufacturing Processes (3 cr.)
Fall and Spring
Manufacturing processes, material properties and their selection for product functions. Structure and characteristics of metal, polymer/wood, ceramic and composite materials will be examined.

MFGT-150 Introduction to Engineering Materials (3 cr.)
Fall and Spring
Exposure to engineering materials, their properties, and behavior. Topics will include: material types, testing, mechanical properties, heat treatment, and material selection. Students are expected to have had high school chemistry. Math Proficiency greater than or equivalent to Math-120.

MFGT-202 Welding and Casting Processes (3 cr.)
Fall and Spring
Lab intensive class utilizing various processes and parameters in the welding and foundry areas. Prerequisites: take MFGT-110.

MFGT-203 Machining Metal Forming Processes (3 cr.)
Fall and Spring
Machine tool concepts providing an operational knowledge of traditional and non-traditional machining processes. Fundamental forming machine and hand tool operations. Sheet metal pattern development. Prerequisites: take MFGT-110.

MFGT-204 Polymer Processes (3 cr.)
Fall and Spring
Introduction to properties of plastic, elastomeric and fiber-reinforced composite materials and the processes used to manufacture products from them. Primary and secondary manufacturing processes used to convert wood-fiber materials into components and/or finished products. Prerequisites: take MFGT-110

MFGT-251 Fundamentals of Plastics Materials and Processing (3 cr.)
Fall and Spring
Introduction to polymers, including their material, mechanical, and rheological properties. Process fundamentals including setup, operation, and troubleshooting of primary and secondary processes through a combination of classroom lectures and laboratory experiments. Introduction into analytical testing methods for characterizing polymers and analyzing defects and failures.
Prerequisites: take MFGT-110, MFGT-150 or PKG-220.

MFGT-252 Material Removal and Forming Processes (3 cr.)
Fall and Spring
Machine tool concepts providing an operational knowledge of machining and metal forming processes. Analysis and application of primary and secondary processing methods for the

manufacture of products. Measurement principles and practice applied to inspection and process control. Development of process designs appropriate for product specifications. Prerequisites: take MFGT-110 or MFGT-150.

MFGT-253 Joining and Casting Processes (3 cr.)
Fall and Spring
Process concepts providing an operational knowledge of the practice and theory of welding, thermal cutting, adhesive bonding, and metal casting processes. Analysis and application of primary and secondary processing methods for the manufacture of products. Development of process designs and practices appropriate for product specifications, inspection and process control. Prerequisites: take MFGT-110 or MFGT-150.

MFGT-303 Computer Aided Manufacturing (3 cr.)
Fall and Spring
Justification for and application of computer assistance in manufacturing process; machine process control, inventory and materials handling, robotics and automated assembly, product design and part grouping in relation to total manufacturing operation.
Prerequisites: take MFGT-203 or MFGT-252, and take CADD-112 or AEC-131.

MFGT-315 Metallurgy (3 cr.)
Fall and Spring
Properties of crystalline solids, production of iron and steel, the carbon-iron equilibrium diagram, principles of heat treatment, properties of ferrous alloys. Production, properties, and theory of the most important non-ferrous metals and alloys.

MFGT-330 Plastics for Teachers (2 cr.)
Summer
Overview of plastics as a manufacturing material. Focus on plastics processes: injection molding, blow molding, extrusion, thermoforming, and reinforced resin composites. Includes lab projects for the technology education classroom and tours to plastic processing industries.

MFGT-341 Injection Molding Technology (3 cr.)
Injection molding process parameters. part and tooling design, materials selection, quoting, rapid prototyping, troubleshooting, and cycle time reduction efforts. Laboratory experiments for understanding various technologies associated with injection molding of quality parts.
Prerequisites: take STAT-130 and MFGT-251.

MFGT-342 Thermoforming and Blow-Molding Technology (3 cr.)
Part/mold design, film/sheet forming techniques, methods of heating, sheet stretching and cooling, draw ratio calculations, materials selection, part thinning, and other aspects of thermoforming. Laboratory experiments for understanding various technologies associated with thermoforming and blow molding of quality parts, including tooling options, failure analysis, and product design.
Prerequisites: take STAT-130 and MFGT-251.

MFGT-343 Extrusion Technology (3 cr.)
Extrusion and the various processes associated with extrusion; profile, flat film, blown film, and die design. Laboratory experiments for understanding various technologies associated with extrusion of quality parts, including tooling options, failure analysis, and product design.
Prerequisites: take STAT-130 and MFGT-251.

MFGT-345 Design and Simulation of Manufacturing Systems (3 cr.)
Fall and Spring
Design of manufacturing systems using contemporary methods and philosophies. Modeling and comparison of system designs using simulation software. Interpretation of experimental simulation results to evaluate system design alternatives. Preparation of technical reports summarizing projects. Statistical knowledge recommended.
Prerequisites: take STAT-130 or STAT-320 or STAT-330.

MFGT-400 Workshop (1-3 cr.)
Fall, Spring and Summer
Special topics manufacturing, providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

MFGT-405 Industrial Robotics (3 cr.)
Fall and Spring
Specifications, planning, purchasing decisions, and programming of industrial robots.
Prerequisites: take MECH-290 or PKG-350.

MFGT-489 Business and Industry Internship (1-8 cr.)
Fall and Spring
Off-campus work and study in student's area of concentration; approved salaried position with cooperating company for a semester or summer session. Junior level or higher. **R**

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MFT Marriage and Family Therapy

MFT-466 Alcoholism and Family Systems Intervention 2 cr.
Spring and Summer
The role of alcoholism in the family and how to intervene therapeutically.

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MSCS Mathematics, Statistics and Computer Science

MSCS-280 Graph Theory With Applications in Computer Science 3 cr.
Spring
Basic logic and proving skills, Boolean Algebra, digital logic, recurrence relation, principles of graph theory, computer representation of graphs, properties of general graphs, structure and properties of special graphs, flow networks, computer applications of graph theory, algorighms and complexity analysis. Prerequisites: take CS-244.

MSCS-390 Topics 1-2 cr.
Topics of current importance in applications of mathematics to problems in business, industry, government or society. May be repeated for additional credit with consent of program director. R

MSCS-446 Numerical Analysis I 3 cr.
Fall
Theory and applications of numerical methods for linear algebra, non-linear equations and polynomial interpolation.
Prerequisites: MATH-158, MATH-275, and CS-145.

MSCS-447 Numerical Analysis II 3 cr.
Theory and applications of numerical methods for approximation, numerical integration and differentiation, differential equations, and Fourier analysis.
Prerequisites: MSCS-446, MATH-255.

MSCS-475 Applied Mathematics Internship 2-8 cr.
Fall, Spring and Summer
Off-campus work and study in approved position to gain experience in using computer and/or statistical techniques in the analysis and solution of real-world problems. Interns receive salaried appointments with cooperating companies for summer or summer plus one semester. Junior level or higher. **R**

MSCS-490 Mathematical Models I 2 cr.
Supervised experiences in construction of mathematical models for the solution of problems in area of student's needs and interests; resource materials. Senior level or higher. Applied Mathematics and Computer Science majors only.

MSCS-491 Mathematical Models II 2 cr.
Continuation of MSCS-490.
Prerequisites: MSCS-490.

MSCS-492 Mathematical and Computational Foundations of Bioinformatics
In depth examination of different types of algorithms employed in bioinformatics, their mathematical foundations, and software implementation. Topics in mapping DNA, sequencing DNA, comparing sequences, predicting genes, finding signals, identifying proteins, repeat analysis, DNA arrays, genome rearrangements, molecular evolution,

phylogenetics, machine learning, systems biology and computational biology. Senior level or higher; Applied Math & Computer Science majors only.

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MSL Military Science and Leadership

MSL-101 Foundations of Officership 1 cr.
Spring
Introduction to the Army profession and military leadership. Exploration of the seven Army values and 16 Army leadership dimensions, as well as some core competencies critical to effective leadership (i.e. management, problem-solving, decision- making). Off campus weekend leadership orientation in a military environment with outdoor physical activities, including pugil stick, obstacle course, land navigation/orienteering, basic rifle marksmanship, and confidence course training.

MSL-102 Basic Leadership 1 cr.
Fall and Spring
Establishes foundation of basic leadership fundamentals such as problem solving, communication, goal setting, and techniques for improving listening and speaking skills. Life skills are reinforced as well as an introduction to counseling and operations orders. Lab provides instruction on squad movement techniques, map reading, physical fitness and marching techniques.

MSL-201 Individual Leadership Studies 2 cr.
Fall
Identification of successful leadership characteristics through the observation of others and self through experiential learning exercises. Students record observed traits (both good and bad) in a dimensional leadership journal and discuss observations in small group settings. The lab applies basic leadership theory and descision making during practical exercises in a field environment. Instructor's consent required. Prerequisite: take MSL-101.

MSL-202 Leadership and Teamwork 2 cr.
HPE Fall and Spring
Examines building successful teams, methods for influencing action, effective communication in setting and achieving goals, the importance of timing the decision, creativity in the problem-solving process, and obtaining team cohesion through immediate feedback. The lab applies basic leadership theory and decision making during practical exercises in a field environment. Prerequisites: take MSL-102.

MSL-301 Adaptive Team Leadership 3 cr.
Fall
Students conduct self-assessment of leadership style, develop personal fitness regimen, and learn to plan and conduct individual/small-unit tactical training while testing reasoning and problem-solving techniques. Students receive direct feedback on leadership abilities. The lab reinforces small-unit tactical training while employing the troop-leading procedure to accomplish planning and decision making. Instructor's consent required.

MSL-302 Leadership Under Fire 3 cr.

Fall and Spring
The role of communication, value, and ethics in effective leadership. Ethical decision making, diversity, spirituality, and survey of Army leadership doctrine. Emphasis on improving oral and written communication abilities. Lab reinforces small-unit tactical training while employing troop-leading procedure to accomplish complex planning and decision making. Instructor's consent required.

MSL-350 Leader Development and Assessment Course Field Experience 2 cr.
Summer
A 33-day ROTC training event designed to develop and evaluate leadership ability, including judgment, common sense, ingenuity and stamina. Perform complex tasks and make difficult decisions in demanding situations. Prerequisites: take MSL-301 and MSL-302.

MSL-401 Developing Adaptive Leaders 3 cr.
Fall and Spring
Develop student proficiency in planning and executing complex operations, functioning as a member of a staff, and mentoring subordinates. Students explore training management, methods of effective staff collaboration, and developmental counseling techniques. The lab hones the students' leadership skills, attributes and abilities as they operate as cadet officers. Instructor's consent required.

MSL-402 Leadership in A Complex World 3 cr.
Fall and Spring
Study includes a case study analysis of military law and practical exercises on establishing an ethical command climate. Students must complete a semester- long Senior Leadership Project that requires them to plan, organize, collaborate, analyze, and demonstrate their leadership skills. The lab continues to sharpen the students' leadership skills. Instructor's consent required.

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MUSIC Music

MUSIC-101 Class Piano I 1 cr.
HUM CRPRF Fall and Spring Semesters
Group instruction in piano technique and repertoire at beginner level. One one-hour lesson per week; additional practice time required.

MUSIC-111 Advanced Piano I 1 cr.
Fall and Spring Semesters
Private instruction in piano technique and repertoire. One 1/2-hour lesson per week; additional practice time required; optional recital.

MUSIC-112 Advanced Voice I 1 cr.
Fall and Spring Semesters
Private instruction in vocal technique and repertoire. One 1/2-hour lesson per week; additional practice time required; optional recital.

MUSIC-130 Music Appreciation 2 cr.
HUM ARTMU Fall, Spring and Summer
Music materials as they pertain to perceptive listening; music and musicians from medieval times to present; students gain significant awareness of great music. Students do not earn credit for both MUSIC-130 and MUSIC-132.

MUSIC-132 Music in Our World 3 cr.
HUM ARTMU ESC Fall, Spring and Summer
Music materials as they pertain to perceptive listening; music and musicians from the beginnings of music to the present. Great music from many cultures. Students do not earn credit for both MUSIC-130 and MUSIC-132.

MUSIC-201 Class Piano II 1 cr.
GEHUM CRPRF Fall and Spring Semesters
Continuation of MUSIC-101 at intermediate level. One one-hour lesson per week; additional practice time required.

MUSIC-206 Music for the Young Child 2 cr.
Fall and Spring Semesters
Music elements and experience, methods and materials for guiding the musical growth of children from birth through third grade. P: MUSIC-101.

MUSIC-211 Advanced Piano II 1 cr.
Fall and Spring Semesters Continuation of MUSIC-111.

MUSIC-212 Advanced Voice II 1 cr.
Fall and Spring Semesters Continuation of MUSIC-112.

MUSIC-264 Jazz Band 1 cr.
HUM CRPRF Fall and Spring Semesters
Jazz styles and improvisation from the dance band era to the present. Study and performance of contemporary "big band" jazz. Membership is open to all qualified students. Instructor's consent required. Membership by audition. **R**

MUSIC-266 Concert Band 1 cr.
HUM CRPRF Fall and Spring Semesters
Fundamentals of musical expression, tone production and quality, and special problems of technique. Membership by audition only. **R**

MUSIC-267 Symphonic Singers 1 cr.
HUM CRPRF Fall and Spring Semesters
Advanced choral techniques, reading and analysis of choral music of all types and periods. **R $**

MUSIC-268 Solo and Ensemble 1 cr.
Fall and Spring Semesters
Coaching of advanced vocal and instrumental performers for public performance. **R**

MUSIC-270 Vocal Jazz Ensemble 1 cr.
HUM CRPRF Fall and Spring Semesters
Performance of vocal jazz in a select choral ensemble. Membership by audition only. **R**

MUSIC-311 Advanced Piano III 1 cr.
Fall and Spring Semesters
Continuation of MUSIC-211. Equivalent to 360-311. **R**

MUSIC-312 Advanced Voice III 1 cr.
Fall and Spring Semesters
Continuation of MUSIC-212. **R**

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NANO Nanoscience/Nanotechnology

NANO-101 Exploration of Nanotechnology (2 cr.)
NSCI TECH LAB
Introduction to main principles and concepts of nanotechnology with an exploration of the societal and environmental impact of nanotechnology across a vast array of fields including health care, manufacturing, environment, biotechnology, energy and food production, and information technology. One year of high school chemistry and math proficiency greater than or equal to MATH-120.

NANO-301 Nanostructures (3 cr.)
Introduction to nanostructured materials, theory of processes to design materials with nanostructure, and properties and behavior of nanostructured materials.
Prerequisites: take NANO-101 and CHEM-341.

NANO-330 Characterization Methods of Nanomaterials (3 cr.)
LAB
Laboratory based course that covers basic techniques and theory of modern characterization methods of nanomaterials. Techniques include: electron microscopy, scanning probe microscopy, diffraction spectroscopy and emission spectroscopy.
Prerequisites: take CHEM-341 and PHYS-282.

NANO-401 Nanotechnology Applications (3 cr.)
Review of current nanotechnology applications including societal effects.
Prerequisites: take NANO-301.

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PE Physical Education and Athletics

PE-101 Aerobic Dance (1 cr.)
HPE ACTV Fall and Spring
Introduction to aerobic dance as a technique for the development of physical fitness.

PE-103 Archery/Beginning (1 cr.)
HPE ACTV Fall and Spring

PE-105 Bow Hunting (1 cr.)
HPE ACTV Fall and WinTerm
Conservation, safety, selection and care of equipment; techniques and practical bow hunting experience.

PE-107 Badminton (1 cr.)
HPE ACTV Fall and Spring

PE-109 Basketball (1 cr.)
HPE ACTV Fall and Spring **R**

PE-110 Bicycling (1 cr.)
HPE ACTV
Bicycling for health and fitness: safety, technique, and knowledge.

PE-113 Bowling (1 cr.)
HPE ACTV Fall, WinTerm, Spring and Summer **$**

PE-115 Canoe Techniques (1 cr.)
HPE ACTV Spring **$**

PE-120 Self-Paced Personal Fitness (1 cr.)
HPE Fall, WinTerm, Spring and Summer
Improvement of personal physical fitness through self-paced exercise programs and fitness activities.

PE-121 Exercise For Fitness (1 cr.)
HPE ACTV Fall, Spring and Summer

PE-122 Fitness Yoga (1 cr.)
HPE Fall and Spring
An introduction to yoga as a mind/body fitness practice.

PE-125 Fly Fishing (1 cr.)
Spring

Fly tying, casting techniques, literature, stream craft, equipment considerations, conservation ethics and natural resources stewardship.

PE-129 Golf(1 cr.)
HPE ACTV Fall, Spring and Summer
Fundamental principles of golf; skills, history, etiquette and application of techniques.
Required: play 27 holes of golf, pay greens fees, furnish three golf balls for class use. **$**

PE-135 Walking/Jogging (1 cr.)
HPE ACTV Fall, Spring and Summer
The study and practice of walking/jogging as an exercise philosophy, as an exercise technique and an exercise program.

PE-136 Ice Fishing (1 cr.)
HPE ACTV WinTerM
An introduction to the sport of ice fishing.

PE-142 Outdoor Skills(1 cr.)
HPE ACTV Fall **$**

PE-143 Rock Climbing (1 cr.)
HPE Fall, Spring and Summer
Rock climbing as a recreational sport.

PE-144 Personal Defense (1 cr.)
HPE ACTV Fall, Spring and Summer
Development of physical fitness for defense consciousness; techniques of initial and basic defense skills in weapon and rape attacks.

PE-145 Practicum in Intercollegiate Athletics (1 cr.)
HPE ACTV Fall, Spring and Summer
Practical experience in intercollegiate athletics, including completion of a season as a member of an intercollegiate team.
Prerequisites: take PE-200. **R**

PE-146 Racquetball/Beginning (1 cr.)
HPE ACTV Fall and Spring

PE-148 Relaxation (1 cr.)
HPE ACTV Fall, Spring and Summer

PE-150 Snowboarding (1 cr.)
HPE Spring
An introduction to the skills and safety aspects basic to snowboarding. **$**

PE-152 Skiing (1 cr.)
HPE ACTV Spring **$**

PE-154 Fishing (1 cr.)
HPE ACTV

History, terminology, regulations, equipment and techniques involved in the recreational activity of fishing.

PE-155 Introduction to Curling (1 cr.)
HPE ACTV $
Definition and application of curling terminology, history, etiquette, technique, and strategy. Curling's interrelationship with mental and physical wellness, and professional opportunities.

PE-156 Soccer (1 cr.)
HPE ACTV Fall and Spring
The development and improvement of the skills and tactics required in the sport of soccer.

PE-159 Softball (1 cr.)
HPE ACTV Spring
The development and improvement of the skills required in the sport of softball.

PE-173 Skin and Scuba Diving (1 cr.)
HPE ACTV Fall, Spring and Summer **$**

PE-176 Tennis/Beginning (1 cr.)
HPE ACTV Fall and Spring

PE-182 Tumbling I (1 cr.)
HPE ACTV Fall and Spring
An introduction to basic tumbling skills, including forward, backward, and sideward rotational skills as well as springing and vaulting movements from the hands and feet.

PE-183 Tumbling II (1 cr.)
HPE ACTV Fall and Spring
Continued study of tumbling techniques including forward and backward rotational skills, twisting, and connections of rotational skills.
Prerequisites: take PE-182 (12527).

PE-184 Tumbling III (1 cr.)
HPE ACTV Fall and Spring
Continued study of tumbling techniques including multiple twisting and multiple flipping rotational skills.
Prerequisites: take PE-183.

PE-185 Volleyball (1 cr.)
HPE ACTV Fall and Spring **R**

PE-187 Weight Training (1 cr.)
HPE ACTV Fall, Spring and Summer

PE-200 Orientation To Intercollegiate Athletics (1 cr.)
Fall and Spring
Introduction to intercollegiate athletics, including NCAA and conference regulations; current issues, such as professional sports, costs, drugs, Title IX, minority issues and ethics; components of athletic programs; physiology of exercise; and psychology of sport.

PE-265 Physical Activities For Young Children (2 cr.)
Fall and Spring
Sequential development of physical perceptual skills in children, birth to age 5; perceptual motor activities that promote development.

PE-345 Basketball Officiating (1 cr.)
Rules and officiating techniques for men's and women's basketball; preparation for DGWS and/or WIAA officiating certifications.

PE-346 Football Officiating (1 cr.)
Application of football officiating rules and techniques.

PE-352 Theory and Management of Coaching (2 cr.)
Fall
Current management principles and practices applied to the profession of coaching.

PE-362 Psycho-Social Aspects of Athletics (2 cr.)
Spring
Examination of the psychology of sport and human movement. Understanding motivation, individual differences and social influence.

PE-401 Coaching Gymnastics (2 cr.)
Elements of gymnastic tumbling and use of gymnastic apparatus as part of a modern physical education program.

PE-460 Coaching Basketball (2 cr.)
Fundamentals and methods of teaching and coaching basketball, definite plan of offense and defense, selected techniques analyzed, rules and practice schedules, theories and their applications.

PE-461 Coaching Football (2 cr.)
Fall
Fundamentals and methods of teaching and coaching football, definite plan of offense and defense, selected techniques analyzed, rules and practice schedules, theories and their applications.

PE-470 Coaching Baseball (2 cr.)
Fundamentals and methods of teaching and coaching baseball, definite plan of offense and defense, selected techniques analyzed, rules and practice schedules, theories and their applications.

PE-471 Coaching Track and Field (2 cr.)
Fundamentals and methods of teaching and coaching track and field, definite plan of offense and defense, selected techniques analyzed, rules and practice schedules, theories and their applications.

PE-478 Coaching and Officiating Volleyball (2 cr.)
Skills and techniques of coaching and officiating competitive volleyball. Instructor's consent required. Prerequisites: take PE-185.

PE-480 Coaching Youth Athletes (2 cr.)
Coaching strategies for organized non-varsity youth sports programs--philosophy, psychology, physiology, pedagogy, prevention and care of injuries, and legalities.

PE-481 Coaching Hockey (2 cr.)
Philosophies, fundamentals and methods of teaching and coaching offensive and defensive hockey skills and strategies; organizing and administering hockey programs at all age levels. Sophomore level or higher.

PE-482 Coaching Softball (2 cr.)
Philosophies, fundamentals and methods of teaching and coaching offensive and defensive softball skills and strategies; organizing and administering softball programs at all age levels. Sophomore level or higher.

PE-483 Coaching Soccer (2 cr.)
Fall and Spring
Philosophies, fundamentals and methods of teaching and coaching offensive and defensive soccer skills and strategies; organizing and administering soccer programs at all age levels. Sophomore level or higher.

PE-490 Practicum in Coaching (1-3 cr.)
Fall, Spring and Summer
On- or off-campus work and study in athletic coaching with competitive teams.

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PHIL Philosophy

PHIL-201 Introduction to Philosophy 3 cr.
HUM PHIL GLP Fall and Spring Semesters
Introduction to the principal problem areas and history of philosophy, as well as to the nature of philosophical investigation.

PHIL-205 Philosophy of Religion 3 cr.
HUM PHIL Fall Semester
Principal philosophical problems in the various dimensions of religious experience and belief.

PHIL-215 Eastern Philosophy 3 cr.
HUM PHIL GLP Spring Semester
Philosophies of India, China and Japan: Hinduism, Buddhism, Confucianism, Taoism and Zen Buddhism.

PHIL-220 Multicultural Philosophy 3 cr.
HUM PHIL ESA
African American, Hispanic American, Asian American, American Indian, and Feminist philosophies. Philosophical issues of race, social justice, values, environmental ethics, spiritual belief, and epistemology.

PHIL-225 Belief, Knowledge and Truth 3 cr.
HUM PHIL
Justification of rational belief and knowledge and methods used for obtaining them, with particular emphasis on problems of evidence and truth.
Prerequisites: take ENGL-102, ENGL-112 or ENGL-113 **.**

PHIL-235 General Ethics 3 cr.
HUM PHIL Fall, Spring and Summer
Ethical valuing process: principal ethical theories and their application to common human problems. Prerequisites: take ENGL-102, ENGL-112 or ENGL-113.

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PHOTO Photography

PHOTO-204 Exploring Photography (3 cr.)
HUM CRPRF
Fundamentals of analog and digital photography with an emphasis on technical processes, principles of composition, aesthetics and paradigms of visual literacy. Students must provide a digital camera with a manually adjustable shutter and aperture.

PHOTO-305 Photo Processes (3 cr.)
Fall, Spring and Summer
Advanced monochromatic photography: aesthetics, advanced theory, view-camera techniques, studio lighting, materials and equipment selection, sheet-film processing, specialized processes and techniques.
Prerequisites: take PHOTO-204. **$**

PHOTO-311 Advertising and Public Relations Photography (3 cr.)
Fall, Spring and Summer
A survey of advertising and public relations photography trends and practices. The relationship between photography, typography and design, image capture, manipulation, file management, workflow, output, as wells as identifying and meeting client needs and expectations are stressed. A digital SLR camera is required.
Prerequisites: take PHOTO-204.

PHOTO-330 Video Production (3 cr.)
Fall and Summer
A survey of digital audio and video production fundamentals with emphasis on workflow, digital capture, editing and manipulation and delivery alternatives.

PHOTO-335 Film-History and Appreciation (3 cr.)
Fall
Evolution of motion picture film as medium of mass communication and aesthetic expression; contributions of noted film producers.

PHOTO-340 History of Photography (3 cr.)
Spring
A survey of the scientific and aesthetic development of photography from its beginnings to the recent practices of photographic technologies in the context of post-modernity. This course will examine the diversity of styles, techniques, methods, and ideologies of selected photographers focusing on their contributions and influences in advertising, art, fashion, communication technology and pop culture.

PHOTO-411 Photojournalism and Documentary Photography (3 cr.)
Fall
A survey of photojournalism and documentary trends and practices for editorial publication. The importance of the still photograph as a conveyor of information and influence on public opinion is emphasized. Ethical and moral considerations, freedom of press and the public's right to know are stressed. A digital SLR camera is required.

Prerequisites: take PHOTO-204.

PHOTO-412 Nature Photography(3 cr.)
Fall, Spring and Summer
Fundamentals of conventional and digital photography, camera techniques, composition, aesthetics, exposure, and light in relation to animals, plants, water, weather and landscapes. Emphasis on appropriate photographic equipment and field techniques for nature photography. Student must provide an adjustable camera.
Prerequisites: take PHOTO-204. **$**

PHOTO-430 Video/Cinema Practicum (3 cr.)
Spring
Cross discipline teams explore selected topic(s) through the completion of professional level video/cinema project(s), from concept to distribution digital media.
Prerequisites: take PHOTO-330.

PHOTO-441 Fashion and Glamour Photography (3 cr.)
Spring
A survey of fashion and glamour photography trends and practices for advertising and editorial publication. Emphasis is placed on studio and location lighting, working with models, hair and make-up artists as wells as wardrobe and prop stylists. The importance of concept and design in creating effective images is stressed.
Prerequisites: take PHOTO-204.

PHOTO-451 Product Photography (3 cr.)
Fall, Spring and Summer
Photography of natural and manufactured products for illustration, documentation, catalog and aesthetic purposes. Studio and field shooting, lighting for various product characteristics and locations, markets and market requirements, photographer-client relations, legal issues. 35mm single lens reflex, medium format, view or adjustable digital (3 megapixel minimum) camera required.
Prerequisites: take PHOTO-204.

PHOTO-495 Professional Portfolio Development (3 cr.)
Spring
Capstone experience for the Applied Photography minor. Students fine tune their direction and concentrate on the area they intend to specialize in their professional career. Students design and produce a portfolio to be evaluated by representative professionals. Standards of professional practice are emphasized. 18 PHOTO credits.

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PHYS Physics

PHYS-150 The Nature ad Application of Light and Color (2 cr.)
NSCI PHYSC
The nature of light and color: the basic principles of our visual perception of nature and the arts are presented for students with no formal background in science.
Math Placement score required or MATH-010.
PHYS-151 Astronomy (3 cr.)
NSCI PHYSC LAB Spring
The solar system, stars, galaxies and the universe. Physical processes and observational methods.

PHYS-211 Introduction to Physics (3 cr.)
NSCI PHYSC Fall and Spring
Introduction to principles of physics, including mechanics, fluids, heat and thermodynamics, light and sound, electricity and magnetism; their applications to specific technologies.

PHYS-212 Introduction to Physics: Lab (1 cr.)
NSCI PHYSC LAB Fall and Spring
Measurement, analysis and presentation of laboratory data on basic physics concepts, including mechanics, fluids, heat, electricity, light and sound. Corequisite courses: PHYS-211.

PHYS-222 Heat and Thermodynamics (2 cr.)
Concepts of temperature and heat, temperature- dependent properties and processes, heat transfer; laws relating heat and other forms of energy.
Prerequisite: take PHYS-231.

PHYS-231 General Physics I (4 cr.)
NSCI PHYSC LAB
Algebra- and trigonometry-based general physics course: mechanics and sound with laboratory. Math proficiency greater than or equal to Math-121.

PHYS-232 General Physics II (4 cr.)
NSCI PHYSC LAB
Algebra- and trigonometry-based general physics course: electricity and light with laboratory.
Prerequisites: take PHYS-231.

PHYS-241 College Physics I (5 cr.)
NSCI PHYSC LAB Fall and Spring
Calculus-based general physics course: mechanics and thermodynamics with laboratory.
Prerequisites: take MATH-153 or MATH-156.

PHYS-242 College Physics II (5 cr.)

NSCI PHYSC LAB Fall and Spring
Calculus-based general physics course: electricity, sound, light and selected topics in modern physics with laboratory.
Prerequisites: take PHYS-241.

PHYS-250 The Physics of Light and Color (3 cr.)
NSCI PHYSC LAB
Properties, sources and perception of light are examined through lectures and laboratory activity. Topics considered are: color systems and vision, optical devices and phenomena; and image formation and appearance.
Prerequisites: take MATH-118, MATH-120 or MATH-123.

PHYS-251 Topics in Astronomy (1 cr.)
NSCI PHYSC
Qualitative analysis emphasizing physical principles of selected topics in astronomy. Significance of modern methods of obtaining astronomical information.

PHYS-255 Meteorology (2 cr.)
NSCI PHYSC Spring
Physical processes that determine properties of the earth's atmosphere: precipitation, atmospheric circulation, weather, climate and human influence on the atmosphere in the framework of physics.

PHYS-257 Introduction to Geology and Soil Mechanics (3 cr.)
Fall and Spring
Physical processes involved in rock formation, mountain building, erosional landscapes, plate tectonics, earthquakes and geologic dating. Elementary soil mechanics.

PHYS-258 Introduction to Geology (2 cr.)
NSCI PHYSC Fall and Spring
Composition of the earth and its physical processes, including geologic time, rocks and minerals, raw resources and energy, volcanism, earthquakes, streams and groundwater, weathering, glaciation, shorelines, deserts, wind, and planetary geology.

PHYS-281 University Physics I (5 cr.)
NSCI PHYSC LAB Fall and Spring
Calculus-based general physics course: mechanics and thermodynamics with laboratory.
Prerequisites: take MATH-154 or MATH-157.

PHYS-282 University Physics II (5 cr.)
NSCI PHYSC LAB Fall and Spring
Calculus-based general physics course: electricity, sound, light, and selected topics in modern physics with laboratory.
Prerequisites: take PHYS-281.

PHYS-321 Statics and Strength of Materials (4 cr.)
Fall and Spring
Force and moment equilibrium including friction, trusses, frames and machines. Simple and compound stress and strain including beams and joints. No credit for students taking PHYS-325 or PHYS-331.
Prerequisites: take PHYS-241 or PHYS-281.

PHYS-325 Strength of Materials (3 cr.)
Fundamental theory of strength of materials. Analysis of tension, compression, shear, biaxial tension and compression, torsion, stresses and deflection of beams.
Prerequisites: take PHYS-231, MATH-153 or MATH-156; or take PHYS-241; or take PHYS-281.

PHYS-327 Solid State Physics (3 cr.)
Crystalline structure, lattice vibration and energy states, Brillouin zones, electrons in metals, semi-conductors, and dielectric and magnetic properties of solids.
Prerequisites: take PHYS-282 or PHYS-242; and MATH-157 or MATH-154.

PHYS-329 Atomic and Nuclear Physics (3 cr.)
Elements of atomic and nuclear physics.
Prerequisites: take PHYS-282; or take PHYS-242 and MATH-154 or MATH-157.

PHYS-330 Science and the Fallible Mind for Educators (2 cr.)
Cross-disciplinary, physical science course primarily intended for educators. Defines and examines science with a perspective on societal issues related to the human mind, consumer marketing, psychology, religion, risk and fear, global concerns, and the use and abuse of numbers. High school algebra.

PHYS-331 Statics (3 cr.)
Essential elements of statics: simple force system, theory and application of non-concurrent forces, couples, friction, non-coplanar forces, trusses and other structures.
Prerequisites: take PHYS-241 or PHYS-281.

PHYS-333 Dynamics (3 cr.)
Essential elements of dynamics: rectilinear, angular and harmonic motions; forces producing motion, work, energy, acceleration, impulse and momentum.
Prerequisites: take PHYS-331.

PHYS-335 Optics (3 cr.)
Optics with emphasis on the wave nature of light: interference diffraction, polarization and coherence; their applications in holography.
Prerequisites: take PHYS-282; or take PHYS-242 and MATH-154 or MATH-157.

PHYS-351 Astrophysics (3 cr.)
Fall, Spring and Summer
Quantitative and qualitative study of the solar system, stars, galaxies and the universe. Physical processes and observational methods and analysis.
Prerequisites: take PHYS-282 or PHYS-242.

PHYS-358 Soil Science and Conservation (4 cr.)
Soil formation and the relationship of its physical, chemical, and biological properties to natural and agricultural ecosystems with implications for sustainable management.
Prerequisites: take PHYS-258 or CHEM-135.

PHYS-360 Physics Modeling for Game Programmers (3 cr.)
Use of mathematics and physics to model the physical world for use in games and other computer simulations. Topics include motion, gravity, collisions, vectors, matrices, differential equations, dynamics, hydrostatics, hydrodynamics, and elastic systems to model common game objects.

Prerequisites: take CS-244, MATH-158, MATH-275, and PHYS-281.

PHYS-380 Electromagnetic Fields (3 cr.)
Development and application of the theory of electromagnetic fields; analysis of the electromagnetic properties of materials and Maxwell's equations.
Prerequisites: take PHYS-282 or PHYS-242, and MATH-255 or concurrent enrollment.
Corequisite course: MATH-255.

PHYS-489 Advanced Physics Experience (1-3 cr.)
Fall and Spring
Experience leading to a deeper understanding of principles and applications of physics.
Junior or higher standing and consent of instructor required.

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PKG Packaging

PKG-100 Packaging and Society (2 cr.)
TECH GLP
A broad overview of the importance of packaging in society. Introduction to packaging and its interrelationship to multiple disciplines including impact on people and the environment.

PKG-150 Packaging Fundamentals (3 cr.)
Explore the purpose of packaging materials and manufacturing methods, including global perspectives, history, environment, market and consumer needs.

PKG-200 Packaging Materials (3 cr.)
Origin, composition, properties and application of packaging materials; lab work in packaging and materials testing methods.
Prerequisites: take PKG-150.

PKG-210 Packaging Materials: Papter, Wood, Adhesives, and Metal (3 cr.)
Technical exploration of paper, wood, adhesives and metal used in packaging worldwide. Material properties and international production processes, applications, environmental impacts of paper, wood, adhesives, and metal.
Prerequisites: take PKG-150 and CHEM-135.

PKG-220 Packaging Materials: Polymers and Glass (3 cr.)
Technical exploration of polymers and glass used for packaging worldwide. Material properties, production processes, applications, environmental impacts of polymers and glass.
Prerequisites: take PKG-150 and CHEM-135.

PKG-250 Consumer Packaging Systems (3 cr.)
The study of packaging from the design concept through production. Lab work on structural design, sample making, and machine operation. Discussions on standard packages and their applications.
Prerequisites: take PKG-200 or take PKG-210 and PKG-220.

PKG-260 Distribution Packaging (3 cr.)
Packaging systems to support the distribution functions. Topics will include shipping containers, palletizing, unitizing, barrier problems, marking and coding for shipment, freight regulations, military specifications and hazardous materials regulations.
Prerequisites: take PKG-200 or take PKG-210 and PKG-220.

PKG-335 Packaging Machinery (3 cr.)
Weighing, forming, filling, sealing, cartoning, capping, labeling, wrapping, casing, uncasing, palletizing/depalletizing machines as applies to the functional capabilities of speed, materials, containers, and operating functions.

Prerequisites: take PKG-200 or take PKG-210 and PKG-220.

PKG-350 Packaging Design and Evaluation (3 cr.)
Chemical and physical protection problems; materials, structure, graphics and regulations in package design; shock and vibration forces in package evaluation; practical applications of evaluation using electronic instrumentation.
Prerequisites: take PKG-250 and PKG-260 and PHYS-241or PHYS-281.

PKG-450 Food Packaging Laboratory (3 cr.)
Solve complex problems in food packaging research and development through understanding the interrelationships of food and packaging in laboratory exercises.

PKG-489 Business and Industry Internship (1-8 cr.)
Off-campus work and study in student's area of concentration; approved salaried position with cooperating company for a semester or summer session. Junior level or higher. **R**

PKG-490 Packaging Development (3 cr.)
Applications of packaging functions: developing a product's complete packaging system, from final production of product to consumer.
Prerequisites: take PKG-350.

PKG-495 Packaging Seminar (2 cr.)
Current packaging problems or developments (subject based on students' interests and current issues).

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PLE Plastics Engineering

PLE-180 Introduction to Plastics 3 cr.
Examine basics of molecular structure, mechanical behavior, and rheological properties of plastics. Overview of plastics processing, new technologies related to processing, post-consumer-life, and introduction to ASTM/ISO standards used for testing and materials characterization.
Prerequisites: MFGT-150.

PLE-305 Extrusion Theory and Application 3 cr.
Advanced applications for extrusion and the various processes associated with extrusion. Profile, flat film, and blown film extrusion as well as blow molding and die design will be discussed at both the macro and micro levels. Laboratory experiments will focus on processing variables, part design, and materials.
Prerequisites: PLE-180 and MFGE-275.

PLE-310 Injection Molding Theory, Design and Application 3 cr.
This course builds on basic injection molding knowledge with an emphasis on design, process cause and effect, troubleshooting, advanced molding techniques, cycle time reduction efforts, thermal management techniques, rapid prototyping, and small parts molding.
Prerequisites: MFGT-341, MFGE-275, and ENGGR-210.

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PM Property Management

PM-100 Introduction to Property Management (2 cr.)
Property management industry overview: types of residential and commercial property managed and career paths within the industry. Understanding relationships among property managers, owners and tenants. PM-

PM-358 Ethical Decision Making in Property Management (3 cr.)
Analysis of ethical decisions in property management. Case studies incorporating major laws impacting the property management industry; codes of ethics of major professional societies in property management.

PM-362 Real Estate Market Analysis and Investment Analysis (3 cr.)
Analytical tools used for decision making by property managers and the stakeholders they serve. Market and investment analysis and role in providing a financial perspective for the property manager and owner. Prerequisites: take BUACT-207.

PM-370 Principles of Property Management (3 cr.)
Management of commercial, multifamily and common interest development property. Employees, management tools, government involvement, client acquisition and tax requirements.

PM-371 Commercial/Residential Property Development and Management (3 cr.)
Exploring factors involved in developing and managing property, both residential and commercial, including undeveloped land. Topics include feasibility studies, financing, appraisal, leases, purchase agreements and management contracts. Prerequisites: take PM-370.

PM-381 Marketing and Leasing Commercial and Residential Property (3 cr.)
Effective marketing practices, leasing strategies and tactics designed to attract and retain qualified residential and commercial tenants to income producing properties. Prerequisites: take PM-370.

PM-470 Seminar in Property Management (3 cr.) Capstone course for Property Management. Preparation of a property management plan for a specific property. Discussion of current trends and industry problems. Exploration of development and operating strategies of property management firms. Prerequisite: take PM-370.

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POLS Political Science

POLS-210 American Government 3 cr.
SBSCI POLS ESB Fall, Spring and Summer
Structures and processes of national, state and local government in the United States; constitutional framework, political theory and ideology, racial and ethnic dimensions of U. S. political culture, civil rights, media, voting, parties, elections, interest groups, and policy making. Comparisons with selected foreign governments.

POLS-220 State and Local Government 3 cr.
State and local governments within U.S. federal system.

POLS-250 Politics and Technology 3 cr**.**
TECH Fall and Spring Semesters
Analysis of the interfacing of technology and politics, focusing on the dynamics of the public policy process involving selected technologies, events, issue groups and governmental institutions.

POLS-260 Problems of U.S. Foreign Policy 3 cr.
Analysis of U.S. foreign policy objectives and decision making; problems of national defense, Third World relationships, economic and resource policies, Presidential/ Congressional authority, intelligence operations and public opinion.

POLS-270 Introduction to Comparative Government 3 cr.
SBSCI GLP
Analysis and comparison of basic political principles, institutions and problems of major Western, Communist and underdeveloped nations; consideration of alternative approaches to political order and change.

POLS-310 Political Parties and Elections 3 cr.
Analysis of modern political parties. Nominating methods, campaigns, elections. Practical politics in legislative bodies; machines and bosses.
P: POLS-210.

POLS-340 International Relations 3 cr.
SBSCI POLS GLP Fall and Spring Semesters
The global political system; influence of technology, ideology, ethnicity, national interests, power, morality, multinational business, international organizations, and economic, demographic and ecological patterns; approaches to managing war, violence, economic relations, global pollution and other international problems.

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POWER Power

POWER-103 Power Mechanics 2 cr.
Internal and external combustion heat engines, mechanical and fluid transmission systems; present and future applications and limitations. Laboratory work emphasized.

POWER-260 Introduction to Fluid Power 2 cr.
Basic fluid mechanics, pneumatics, hydraulics, control systems and common industrial circuits.

POWER-303 Mechanical Power Transmission 3 cr.
Fundamentals of mechanical power transmission: theory of operation, selection of components, suggestions for application, and analysis of systems.

POWER-361 Industrial Hydraulics 2 cr.
Theory, operation and construction of hydraulic systems and circuits; pumps, reservoirs, lines, control valves and actuators.

POWER-362 Industrial Pneumatics 2 cr.
Theory, operation and construction of pneumatic and pneumatic/hydraulic system components, with application to basic industrial circuits; compressors, plumbing, control valves and actuators.

POWER-395 Seminar 1-2 cr.
Specific content is designed to upgrade competencies of participants. Content will change to reflect current state of the art in electricity/electronics or power mechanics. **R**

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PSYC Psychology

PSYC-100 Psychology Seminar I — Foundations (1 cr.)
Fall and Spring
An orientation activity for all students in their initial semester as a psychology program student. Information concerning psychology as a discipline, applied profession, and liberal arts program is presented. Career and graduate training opportunities are reviewed.

PSYC-110 General Psychology (3 cr.)
SBSCI PSYC ESC Fall, Spring and Summer
An introduction to psychology as a discipline and applied science. Emphasis is placed on scientific methodology as it is applied to behavior, learning, memory, perception, motivation, development, individual differences, mental health, the physiological basis for behavior, and on the application of
psychological principles to human experience.

PSYC-120 Psychology of Adjustment (3 cr.)
Fall and Spring
Principles, models and theories of psychology applied to understanding self, others, relationships and problems of contemporary life. Emphasis on healthy and effective personal and interpersonal life coping skills. Strategies and resources for confronting common life adjustment concerns.

PSYC-190 Psychological Research Methods (4 cr.)
Fall and Spring
An introduction to research methods used in the behavioral sciences. Lecture and laboratory activities involve applications of methodologies and computer technologies to understand and produce research compatible with American Psychological Association standards.

PSYC-210 Introduction To Applied Psychology (3 cr.)
ESB Fall and Spring
Introduction to the application of psychological theories, methods of investigation, and research findings to a diverse spectrum of social problems. Emphasis is placed on the use of scientific psychology to improve aspects of everyday life.
Prerequisites: take PSYC-110.

PSYC-251 Child Psychology (3 cr.)
Fall, Spring and Summer
A study of the total psychological development of children emphasizing age groups spanning the pre-school and pre-pubescent child and methods for scientific measurement and understanding of child behavior.
Prerequisites: take PSYC-110.

PSYC-270 Social Cognition and Behavior (3 cr.)
Fall and Spring

Social factors affecting the behavior, thought processes, and attitudes of individuals. Includes attitude assessment and change, prejudice, interpersonal attraction, social influence, aggression, cognitive biases, and attributions.
Prerequisites: take PSYC-110.

PSYC-280 Forensic Psychology, Law and Ethics (3 cr.)
Surveys the interface between psychology and law in relation to theoretical and applied cognitive, social, developmental and clinical areas. Psychologists' ethical responsibilities in improving legal, mental health, family and criminal law, and law enforcement domains included. Interventions for victims and offenders addressed. Cultural bias/fairness explored. Focused on United States.
Prerequisites: take PSYC-110.

PSYC-281 Environmental Psychology (3 cr.)
Spring
Psychological aspects of person/environment interaction. People impacts on environment, and environmental impacts on people. Aspects of recreational environment, population density and stress factors.
Prerequisites: take BIO-101 or BIO-111.

PSYC-290 Interpreting Psychological Research (3 cr.)
Fall and Spring
Interpretation and evaluation of quantitative statistical arguments presented in psychology- related journals, news, and political discourse; development of analytical and critical thinking skills related to statistical analyses and arguments; interpretation of APA style results sections, including correlation, regression, ANOVA, power and effect size.
Prerequisites: take PSYC-110 and PSYC-190 and STAT-130 or STAT-320.

PSYC-300 Psychology Seminar II - Career Preparation (1 cr.)
Exploration of postgraduation options for psychology majors. Development of skills and knowledge for seeking postgraduate employment and/or graduate school admission.
Prerequisites: take PSYC-100 and PSYC-110.

PSYC-320 Psychology: Its History and Systems (3 cr.)
Fall, Spring and Summer
History of psychology and influence of early competing schools of thought: structuralism, functionalism, behaviorism, Gestalt psychology, and psychodynamic psychology. Evolution to present as a diverse behavioral science with emphasis on neobehaviorism, humanistic psychology, and cognitive psychology.
Prerequisites: take PSYC-110; take 9 credits of PSYC.

PSYC-330 Psychology of Learning (3 cr.)
Fall
A course designed to acquaint the student with the principles of learning drawn from experimental and theoretical psychology. These principles are demonstrated as they apply to animal and human learning. Modern viewpoints toward theories of learning are emphasized.

PSYC-333 Drugs and the Brain (3 cr.)
Fall and Spring
Comparison of psychoactive drug classes, including drugs used for treatment of psychological disorders, recreational drugs, and illegal drugs, with focus on brain and behavior. Evaluation of role of psychological, biological, and sociological factors in drug use

and abuse.
Prerequisites: take PSYC-110.

PSYC-335 Motivation and Emotion (3 cr.)
Fall, Spring and Summer
An experimentally oriented introduction to the fundamental principles of motivation and emotion. Prerequisites: take PSYC-110; take 9 credits of PSYC.

PSYC-340 Psychology of Individual and Group Differences (3 cr.)
ESC Fall
Nature and extent of differences if individuals and groups are studied. Intelligence, achievement, aptitudes, interests, attitudes, and general personality are the major differences included. Race, sex, nationality, social class and age in relation to individual differences are studied. Prerequisites: take PSYC-110; take 2 courses from PSYC.

PSYC-351 Children's Social Reasoning (3 cr.)
ESC Fall
Focused, in-depth study of social reasoning from birth through late childhood. Empathy, friendship, altruism, multicultural perceptions, shyness, assertiveness, aggression, loneliness, morality, values, and global responsibility. Heredity/environment-based theories. Assessment tools and prevention and intervention programs.
Prerequisites: take PSYC-251, HDFS-124, HDFS-264, or PSYC-270.

PSYC-352 Adolescent Psychology (3 cr.)
Fall, Spring and Summer
The physical, emotional, social, moral, and intellectual development of secondary school youth.
Prerequisites: take PSYC-110.

PSYC-355 Clinical and Counseling Psychology (3 cr.)
Explores methods by which Clinical and Counseling Psychologists assess and treat psychological problems and promote well-being, applying various psychological theories and research. Addresses similarities/differences of the mental health professions in philosophy, perspectives, typical career choices/duties, and training/licensure requirements. Discusses professional issues and specialty areas.
Prerequisites: take PSYC-110.

PSYC-360 Personality Theories and Applications (3 cr.)
Spring
Definition of personality and analysis of historical and contemporary approaches to the study of personality. Examines personality theories, personality assessment, cultural and other group difference impacts on personality, applications of personality, and personality self-assessment.
Prerequisites: Take PSYC-110 and a minimum of 9 credits in PSYC.

PSYC-361 Abnormal Psychology (3 cr.)
Fall, Spring and Summer
A study of more serious mental disturbances. Emphasis on the growing importance of mental disorders and on their early detection and referral is studied.

PSYC-370 Interpersonal Effectiveness Training (2 cr.)
Fall, Spring and Summer

Training in effective interpersonal communication attitudes and skills for creating healthy relationships including self-awareness/self- expression, understanding others' communication, assertive rights/responsibilities, dealing with difficult emotions, conflict management/resolution and mediation, collaborative problem solving and teamwork, and gender differences in communication style.

PSYC-371 Introduction To Health Psychology (3 cr.)
Fall
Principles of psychology applied to the promotion of health and wellness; prevention of disease, injury and premature death; psychological treatment of illness; improvement of health care; and formation of health policies. Instructor's consent required. Prerequisites: take 10 credits of PSYC.

PSYC-372 Psychology of Sex and Gender (3 cr.)
ESC Spring
Differences and similarities between females and males; psychosocial implications on personal and political status and the resulting influence on identity and self-concept.

PSYC-375 The Psychology of Marriage and the Family (2 cr.)
Fall
A study of the interpersonal relations involved in dating, mating and family collaboration with growing awareness of patterns for self- integration.

PSYC-377 Consumer Psychology (3 cr.)
Fall
Psychological principles and theories from the areas of motivation, perception, learning, attitude, information processing, personality, groups, organizational psychology, and environmental psychology are applied to the understanding of consumer behavior, consumer problems, and their solution.
Prerequisites: take PSYC-110.

PSYC-379 Public Relations (2 cr.)
Fall, Spring and Summer
Introduction to public relations in industry and education including community relations, employee relations, customer relations, media relations, tools of public relations, two-way communications, and special publics.

PSYC-381 Industrial/Organizational Psychology (3 cr.)
Spring and Summer
Principles of industrial and organizational psychology with emphases on assessment of individual differences in cognitive, physical and interpersonal abilities as they relate to measurement of work performance, employee selection, training and development methods, and development of organizational methods for improved motivation, job satisfaction, leadership and organizational effectiveness.
Prerequisites: take PSYC-110.

PSYC-382 Human Resource Management (3 cr.)
ESC GLP Fall, Spring and Summer
Organization and coordination of personnel practices and methods. Consideration given to communication, employment, orientation and training, working conditions, supervision, performance evaluation, collective bargaining, salary administration, health and recreation of a diverse workforce employed in domestic and international settings.

PSYC-390 Experimental Psychology (4 cr.)
Fall and Spring
Experimental research methods used in basic and applied areas of psychology. Methodological issues introduced in context of actual research problems for integrated treatment of content and methodology. Students will apply this knowledge by participating in laboratory activities and designing and conducting their own experiments.
Prerequisites: take STAT-130, PSYC-190.

PSYC-391 Applied Psychophysiological Methods (3 cr.)
Fall
Theory, methods, laboratory procedures, and applications of physiological responses to psychological stimuli.
Prerequisites: take BIO-132.

PSYC-401 Workshop: Special Topics in Psychology (1-3 cr.)
Current specialized topics studied in a small group setting utilizing experimental activities. Instructor's consent required. **R**

PSYC-403 Management of Employee Reward Systems (3 cr.)
Fall, Spring and Summer
Review of issues in the reward and compensation of employees and of systematic methods for the determination of employee wages, incentives and benefits. Psychological theories of motivation, external equity, job analysis, identifying compensable factors used in job evaluation, comparable worth and performance appraisal, individual salary determination.
Prerequisites: take PSYC-382.

PSYC-432 Perception (3 cr.)
Fall
This course serves as an introduction to human perception. The content of the course is structured around an information processing model, with the sensory and memory facilities considered as information systems. The student will analyze perceptual research, become familiar with classical and modern psychophysical techniques and conduct experimentation in human information processing.

PSYC-442 Cognitive Processes (3 cr.)
Spring
Cognitive theories of attention, memory, language, reasoning and problem solving with applications to fields of education, vocational rehabilitation, gerontology, forensic, clinical and counseling psychology.
Prerequisites: take PSYC-110.

PSYC-451 Children's Learning (3 cr.)
Spring
Psychological study of basic learning processes in infants and young children. How and why learning occurs and how the course of learning can be modified; discussed from theoretical, research, and practical orientations including simple behavioral responses, concepts and language. Prerequisites: take PSYC-110.

PSYC-480 Individual Research Project I (1 cr.)
Fall and Spring
Preliminaries of active research through the development of a research proposal which includes the problem statement, review of the literature and the design of the research project. Prerequisites: take PSYC-210, PSYC-390. **R**

PSYC-481 Individual Research Project II (1 cr.)
Fall and Spring
Research in a personal area of interest within the behavioral sciences. Requirements include the completion of a research report which meets APA guidelines. Prerequisites: take PSYC-480. **R**

PSYC-485 Recruitment and Selection of Human Resources (3 cr.)
Fall, Spring and Summer
In-depth examination of the processes involved in the design and implementation of procedures for selecting employees; the impact these procedures have on the organization; and recruitment, job analysis, testing methods, legal issues, selection strategies, career development. Prerequisites: take PSYC-382.

PSYC-490 Psychological Measurement (3 cr.)
Spring
An introduction to the assumptions, models and applications of measurement techniques in behavioral science. Test analysis, item analysis, reliability, and validity are extensively covered. The course also introduces the student to prediction and measurement of attitudes and opinions.

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RC Risk Control

RC-271 Safety Principles and Practices (3 cr.)
Principles of accident prevention; school safety programs; identification of resources and content: motor vehicle, home, public, farm, industrial, school, recreational and civil defense.

RC-301 Seminar (1-2 cr.)
Structured analysis of regulatory and curricular issues that traffic safety educators should be conversant with. **R**

RC-371 Alcohol, Drugs and Accident Prevention (3 cr.)
Impact of alcohol and drug use on accident prevention programs; current efforts to rehabilitate alcohol and drug abusers.

RC-372 Behavior Approach To Accident Prevention (3 cr.)
Behavioral aspects of accident prevention from physiological, psychological, sociological and cultural perspectives; identifying, understanding and modifying attitudes and behavior.

RC-374 Driver Education Laboratory Methods and Techniques (3 cr.)
Role, aims and objectives of laboratory programs in driver and traffic safety education; multiple- student teaching techniques, simulation on-street behind-the-wheel and multiple-car driving range experiences provided.

RC-375 Driver and Traffic Safety (3 cr.)
Classroom phase of driver education: curriculum selection and use, instructional resources and materials, and driver education administration.

RC-381 Principles of Occupational Risk Control/Safety (2-3 cr.)
Fall, Spring and Summer
An introduction to risk control/safety approaches which are intended to protect employee, property, legal, environmental, and financial-based assets through the development of internal practices/standards which promote the systematic anticipation, identification, analysis, and control of risks that are inherent to the operation.

RC-383 Occupational Safety Health and Environmental and Standards (3 cr.)
Fall and Summer
Understanding and proper application of a range of regulations and standards relating to occupational and environmental safety and health.

RC-386 Fire Protection (2 cr.)
Spring
Behavior of fire: chemistry, protection, prevention and control.

RC-387 Human Factors Engineering/Ergonomics (3 cr.)

Fall
Physiological and psychological abilities in human/machine interface, working performance, reliability, comfort and safety; effective design of people and work environment as a cybernetic system.

RC-388 Construction Safety (3 cr.)
Fall and Spring
An overview of construction safety and health, including identification of the most common occupational hazards associated with the construction industry. Emphasis is on evaluating hazards, choosing appropriate controls to protect workers, and developing strategies for implementing these controls into effective management systems.

RC-389 Fleet Risk Control Management (3 cr.)
Spring
Logistically-oriented management systems required to control risk in fleet operations including internal standards development/analysis, emergency response, accident analysis, loss benchmarking, driver selection and training, vehicle operation, substance abuse testing, hours of service, vehicle maintenance/inspection, route planning, cargo/ personnel security, hazardous materials transportation, and regulatory controls. Prerequisites: take RC-381 or RC-388.

RC-390 Product/Service Liability (2 cr.)
Spring
An analysis of product liability losses, laws and controls.

RC-392 Construction Risk Management (3 cr.)
Analysis and application of fundamental process steps for construction job site risk management. Prerequisites: take RC-388.

RC-395 Emergency Preparedness and Response (3 cr.)
Fall
Specific emergency response plans that meet federal, state and local regulations.

RC-440 Environmental Leadership and Sustainability Management (3 cr.)
Fall and Spring
Analysis and evaluation of topics related to environmental leadership and sustainability management. Environmental and sustainability issues and management challenges will be explored to promote cost-effective management strategies.
Prerequisite/Co-requisite: RC-383

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RD Design, Research and Development

RD-100 Introduction to Industrial Technology 1 cr.
Definition, history, and future of the industrial technology field and the present and emerging concentration areas. Business and industry links to options within industrial technology and the necessary preparation to meet graduates' future professional demands.

RD-205 Design for Industry 3 cr.
Industrial research and development experiences focusing on problems related to product development, innovation and problem solving, manual, semi-automatic and automatic production processes. Development and application of various systems for selection of materials and processing will be studied.

RD-320 Prototype Development and Model Making 3 cr.
Introduction to model making and prototype development/construction. Competencies are developed in converting design, research and development and other creative ideas into three-dimensional objects using traditional and non-traditional machining and forming techniques. Three-dimensional design problems form the core of this course.
Prerequisites: MFGT-110 or MFGT-150 or PKG-210.

RD-420 Research and Development 2 cr.
Research and development procedures applied to specific industrial material and processing problems.

RD-421 Research and Development Laboratory 1 cr.
This lab is taken in conjunction with RD-420 to allow students in technical majors to fulfill the requirements of the major research and design project.
Corequisite: RD-420.

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REHAB Vocational Rehabilitation

REHAB-101 Introduction to Rehabilitation (3 cr.)
Fall and Spring
An introduction to serving people with disabilities. Philosophy, history, legislation, concepts and processes, and careers in rehabilitation services.

REHAB-102 Community Resources (3 cr.)
Fall and Spring
Role of community resources in rehabilitation.

REHAB-205 Rehabilitation Practicum (3-4 cr.)
Fall and Spring
Community based learning in application of rehabilitation concepts and principles. Includes weekly seminar for critique and skill development.
Prerequisites: take REHAB-101 minimum grade C; take REHAB-102 minimum grade C.

REHAB-230 Psychosocial Aspects of Disability (3 cr.)
ESC Fall and Spring
Subjective, objective, ethnic/cultural, and environmental factors related to the disability experience.
Prerequisites: take REHAB-101.

REHAB-300 Special Topics in Rehabilitation(1-2 cr.)
Special topics not available through regular courses. **R**

REHAB-300G Grantsmanship in the Helping Professions (1-2 cr.)
Summer
Explore grant writing in human service occupations and the necessity for such proposals as an element of change in society. Methods used to seek funding sources and evaluate requests for proposals.

REHAB-300N Community-Based Rehabilitation Services (1 cr.)
An examination of national priorities for community-based services designed to enhance competitive employment options for severely disabled persons.

REHAB-305 Sign Language I (3 cr.)
COMSK LANG Fall
Basic course in manual communication with persons who are deaf. Intensive practice in expressive and receptive communication.

REHAB-306 Sign Language II (3 cr.)
COMSK LANG Spring

Intermediate course in manual communication with persons who are deaf. American sign language, increasing sign vocabulary and communication speed.
Prerequisites: take REHAB-305.

REHAB-310 Vocational Evaluation (3 cr.)
Fall and Spring
Development of an individualized approach to conducting vocational evaluations with individuals with disabilities. Skill development in planning, selecting, and using assessment to OLS/techniques, and communicating findings.
Prerequisites: take REHAB-101 and REHAB-102.

REHAB-315 Rehabilitaiton and Criminal Justice (3 cr.)
Fall
Criminal justice system: Process and individual rights. Crime data and criminal law, policing, adjudication. Process roles of corrections and professionals. Disability: Demographics, issues and responses.

REHAB-320 Rehabilitation and Chemical Dependency (3 cr.)
Fall
Chemical use and abuse with emphasis on the rehabilitation of persons who are chemically dependent and the historical and sociological implications of drug usage.

REHAB-321 Rehabilitation of Public Offenders (3 cr.)
Spring
Emphasis on programs designed to rehabilitate persons who are public offenders and sociological issues connected with the judicial system.

REHAB-325 Rehabilitation and Sensory Disability (3 cr.)
Introduction to persons with hearing and visual impairments or both. Methods and techniques used in sensory disability rehabilitation are discussed.

REHAB-327 Psychiatric Rehabilitation (3 cr.)
Fall
Goals and processes of psychiatric rehabilitation.Knowledge and application of skills for integrating diagnosis into planning and intervention with a focus on rehabilitation services for individuals with long-term mental illness in community-based settings.
Prerequisites: take PSYC-361 and REHAB-230.

REHAB-333 Adolescent Substance Use and Abuse (2 cr.)
Summer
Major concepts, current trends, and culturally sensitive approaches in the assessment, prevention and treatment of adolescent alcohol and drug addiction.

REHAB-350 Independent Living (2 cr.)
Fall
An overview of independent living programs in this country including evolution, goals, methods of service delivery, and management of the independent living program.

REHAB-351 Benefits Coordination: Practice and Application (3 cr.)
Summer

Benefits specialist's role and function;rehabilitation content applications. Benefits program requirements: process and application.
Prerequisites: take REHAB-102.

REHAB-355 Rehabilitation of the Older Disabled Worker (2 cr.)
Develop awareness and understanding of older disabled workers with a focus on implementing rehabilitation planning that enables continued participation in the work force or reinsertion into it following disability.

REHAB-360 Assistive Technology (2 cr.)
Spring
Provision of technology to enhance the lives of persons with disabilities. Delivery system, legislation, and issues related to funding are examined. Specific applications in communication, computers, mobility, and workstations and other technologies are reviewed.

REHAB-361 Microcomputer Applications in Rehabilitation (2 cr.)
Applications of microcomputer technology and adaptive devices in vocational evaluation, work adjustment, placement and administration.

REHAB-365 Laboratory in Rehabilitation Technology (2 cr.)
Spring
Experience utilizing technological aids/devices developed for persons with disabilities. Modify/adapt equipment to meet specific functional requirements. Construct switch/control mechanisms for equipment. Develop prototype solutions to vocational and independent living problems.
Prerequisites: take REHAB-360.

REHAB-401 Principles and Techniques of Caseload Management (2 cr.)
Fall and Spring
Principles and techniques of implementing case load management in service of clients of state vocational rehabilitation counseling agencies or rehabilitation facilities.
Prerequisites: take REHAB-230.

REHAB-402 Management of Non-Profit Organizations (3 cr.)
Spring
Principles and practices in the operation of non-profit organizations. Comparison of how non-profit and for-profit operations are affected by organizational structures and authority, budgeting practices, sources of income, personnel issues, strategic planning and program evaluation, and marketing. Application to community agencies.

REHAB-410 Job Placement Processes (3 cr.)
Fall and Spring
Placement theory and methods used to assist people with disabilities to obtain appropriate employment.
Prerequisites: take REHAB-230.

REHAB-420 Psychological Testing People With Exceptional Needs (2-3 cr.)
Fall, Spring and Summer
Use of common psychometric tests with specific emphasis on selection, evaluation, administration, scoring, and interpretation of standardized tests for individuals who are

disabled, including those from various ethnic and cultural groups.

REHAB-452 Group Processes in Rehabilitation Settings (2 cr.)
Fall
Theory and application of group processes in rehabilitation settings; direct experience as member and facilitator of a group.

REHAB-459 Workforce Development, Disability, and Socioeconomics (3 cr.)
Macro/micro influences that keep people unemployed and underemployed, including community, services, providers, employers, and families. Interface among legislative initiatives, disability, and life/work. Policy, strategies, and skills that promote effective intervention and change. Intended for professionals in the field.

REHAB-460 Rehabilitation in the Private Sector (3 cr.)
Spring
Case coordination to support maximum medical recovery and/or vocational rehabilitation of an injured person involved in insurance funded cases. Differences between public and private rehabilitation processes. Interviewing, planning, assessing transferable skills, placing in suitable work, and communicating with other involved individuals. Business practices, professional roles, and ethical issues.
Prerequisites: take REHAB-310.

REHAB-461 Forensics For the Human Service Professional (2 cr.)
Spring
Terminology and practices associated with forensic for human service professionals. Strategies and materials related to preparation for testimony and expert witness testimony in a court of law and other legal settings.

REHAB-462 Absence Management (3 cr.)
Spring
Orientation to workers with disabilities in business and industry. Focus on reducing disability related costs, and the elimination of attitudinal and environmental barriers as they pertain to hiring, productivity, and retention of workers with disabilities. Governmental require- ments, linkage between business, community resources, and rehabilitation.

REHAB-470 Work Adjustment Services (2-3 cr.)
Fall and Summer
Principles and procedures of adjustment services. Emphasis upon the change and improvement of behavior. Supervised practical experience in interviewing, behavior observation, individual work adjustment planning, lesson plan development and report writing.
Prerequisites: take REHAB-310.

REHAB-480 Advanced Rehabilitation Practicum (2-6 cr.)
Fall and Spring
Advanced experience in service delivery to persons with disabilities in varied agency/ service settings related to student's designated rehabilitation concentration. Instructor's consent required. **R**

REHAB-482 Sexuality and Disability (2 cr.)

Spring
Investigate sexuality as an integral part of the disability experience. Explore programs, techniques and personal biases in relation to sexuality of persons with disabilities.

REHAB-483 Vocational Counseling Issues (2 cr.)
Summer
Theoretical and applied approaches to vocational counseling and current research in vocational choice and career development as related to vocational counseling.

REHAB-488 Developing Collaborative Partnerships (3 cr.)
Fall
Development of professional relationships that are characterized by collaboration and respect for the consumer or student. Role of team members including human service professionals, consumer student, family members, school personnel, and community organization staff in collaborative decision making. Enhanced service delivery responsiveness through application of collaborative principles.

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SCIED Science Education

STMED-101 Introduction to Math and Science Education (2 cr.)
Fall
Overview of math and science education programs, roles and responsibilities of math and science teachers, state and professional standards, history of math and science education, professional resources, curriculum, instruction, assessment, and classroom management.

SCIED-301 Science Education Methods (3 cr.)
Fall
Methods of teaching science; theories and applications, issues and trends. Background check required.

SCIED-360 Science Education Curriculum and Assessment (3 cr.)
Fall
Curriculum and assessment for teaching science; theories and applications, issues and trends. Background check required.

SCIED-409 Broadfield Science Student Teaching (4-16 cr.)
Spring
Student teaching experiences in science education. Benchmark I completed. Senior Level or Higher.

SCIED-410 Biology Student Teaching (4-16 cr.)
Fall, Spring and Summer
Student teaching experience in biology. Benchmark II Completed.

SCIED-411 Chemistry Student Teaching (4-16 cr.)
Fall, Spring and Summer
Student teaching experience in chemistry. Benchmark II completed.

SCIED-412 Physics Student Teaching (4-16 cr.)
Fall, Spring and Summer
Student teaching experience in physics. Benchmark II completed.

SCIED-413 Broadfield Science Teaching Internship (4-16 cr.)
Fall, Spring and Summer
Internship experience in teaching broadfield science. Benchmark II completed.

SCIED-414 Biology Teaching Internship (4-16 cr.)
Fall, Spring and Summer
Internship Experience in teaching biology. Benchmark II completed.

SCIED-415 Chemistry Teaching Internship (4-16 cr.)
Spring

Internship experience in teaching chemistry. Benchmark II Completed.

SCIED-416 Physics Teaching Internship (4-16 cr.)
Fall, Spring and Summer
Internship experience in teaching physics. Benchmark II completed.

SCIED-488 Internship Teaching – Science Education (8-16 cr.)
Spring
Alternative to student teaching experience: licensed and salaried internship in a cooperating school. Benchmark II Completion. Senior Level or Higher.

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SCOUN School Counseling

SCOUN-301 Introduction to Guidance (2 cr.)
Fall, Spring and Summer
Policies and practices of organized guidance programs in educational settings; historical, philosophical and cultural bases for guidance services; guidance techniques for teachers; cooperative efforts of teachers, parents and counselors.

SCOUN-400 Workshop: Counseling/Psychological Services (1-2 cr.)
Summer **R**

SCOUN-405 Emerging Issues in School Counseling (2 cr.)
Fall, Spring and Summer
Identify, explore and research issues and trends impacting practice and resources in school counseling. Student must be currently employed in a school setting or licensed to work in schools.

SCOUN-447 Emotional and Behavior Problems of Children and Adolescents (3 cr.)
Spring and Summer
Assessment, identification and evaluation of emotional and behavioral disorders of learners middle childhood through adolescence, including methods of observing, diagnosing, documenting and interpreting. Characteristics of emotional and behavioral disabled learners, including potential concomitant physical, cognitive, or sensory disabilities and psychological, social and environmental factors contributing to childhood emotional and behavioral disorders.

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SMGT Sustainable Management

SMGT-115 Environmental Science and Sustainability (3 cr.)
The interrelationships between humans and the environment. Important ecological concepts, human influence on the environment, and sustainable practices to avoid or ameliorate negative impacts. Ecological concepts are used throughout to identify, understand, and provide a better understanding of how humans can more positively affect the environment in which they live. Prerequisites: B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-230 Triple Bottom Line Accounting for Managers (3 cr.)
Financial and managerial accounting and how this information is used. Basic preparation of financial statements and their analytical use. How accounting information is applied by managers in decision-making process helping organizations meet the triple bottom line: strong profits, healthy environment, and vital communities. Prerequisites: College Algebra. For B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-235 Economics in Society and Sustainability (3 cr.)
Economic, social, and environmental issues facing society. Traditional issues such as markets and prices (microeconomics), government economic management (macroeconomics), and international trade. Introduction of economic content into analysis of selected topics such as poverty and discrimination, the environment, and the provision of government services. Critiques of conventional economic thought, within the context of systems thinking and ecological economics, and integrated throughout the course. Prerequisites: College Algebra. For B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-240 Technical Writing for Sustainable Management (3 cr.)
The psychology and mechanics of written business communications are thoroughly explored and widely applied. Also included are non-written applications in such business areas as international/intercultural, nonverbal, and ethical communications Prerequisites: For B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-310 Ecology for Sustainable Management (3 cr.)
Interrelationships of organisms with each other and their environments. Investigation into composition and dynamics of populations, communities, ecosystems, landscapes, and the biosphere with emphasis on sustainability. Enrollment in online Sustainable Management degree program required. Prerequisites: B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-315 Global Environmental Chemistry (3 cr.)
An exploration of chemical environments as interdependent thermodynamic and kinetic

systems. The "system/surroundings" perspectives of thermodynamics will be applied to systems of progressively larger size in order to arrive at the comprehensive view of the global environmental system. Prerequisites: CHEM-115

SMGT-320 Energy for Sustainable Management (3 cr.)
Learn to apply basic engineering principles to existing and emerging energy technologies to provide a better understanding of energy production, consumption, and environmental impact; and how these principles relate to sustainable management. Topics cover a wide range of energy systems including nuclear, fossil fuels, wind, solar, biofuels and biomass. Prerequisites: Take CHEM-115.

SMGT-325 Natural Resource Management (3 cr.)
The interdependence between natural resources associated with land, air, and water. Explores significant environmental issues regarding the policies and problems in the use and management of natural resources related to soils, vegetation, landscape within the context of social needs and sustainability. Prerequisites: B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-330 Marketing for a Sustainable World (3 cr.) Analysis of an organization's opportunities to develop sustainability practices as they relate to the development of product, pricing, supply and distribution channels (retail, wholesale), promotion (advertising, sales promotion, public relations) and target markets. Prerequisites: Take SMGT-235. For B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-331 Sustainable Organizational Finance (3 cr.)
Introduction to the theory and methods of sustainable organizational finance. Topics include financial statements; discounting and budgeting; uncertainty and risk/reward trade-offs; and assessing financial implications of the triple bottom line (e.g., climate change, carbon trading, human resource management, and creating environmentally-conscious shareholder value.) Prerequisites: Statistics, SMGT-230, and SMGT-325

SMGT-332 Economics of Environmental Sustainability (3 cr.)
Interaction between market activity and the environment, applies economic analysis to the efficient and sustainable management of environmental goods and resources, and examines how economic institutions and policies can be changed to bring the environmental impacts of economic decision-making more into balance with human desires and the needs of the ecosystem. Prerequisites: Take SMGT-235. For B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-335 Management and Environmental Information Systems (3 cr.) Use of the computer as a problem-solving tool, as part of data processing systems; information systems and decision support tools for managers; information systems planning and development; overview of computer hardware, software, database management, networking and web technologies; green data centers; energy efficient trends in information technology; data and information usage in green businesses. Prerequisites: Take Statistics and SMGT-230.

SMGT-340 Organizational Behavior and Sustainability (3 cr.)
Management principles and theories underlying human behavior in organizations are investigated. Topics include personality, motivation, communication, decision-making,

leadership, teamwork, ethics, power, diversity, and work stress. Constraints and opportunities of an "eco" friendly organization and realized. Prerequisites: Introductory Speech/Communication course. B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-350 Operations Management and Sustainability (3 cr.)
The role of the operations function in an organization; linear programming; continuous and intermittent production processes; aggregate planning; inventory control; materials management; scheduling; project management; quality assurance; operations for green enterprises. Prerequisites: Take STAT-130 and MATH-120, or obtain advisor's consent.

SMGT-360 Environmental and Sustainability Policy (3 cr.)
Topics include the spectrum of historical, theoretical and technical issues applicable to sustainable management of natural resources, environmental quality standards and risk management. Administrative structures that form the basis for selecting appropriate responses to complex management problems faced by industry, government and non-governmental agencies and identified. The historical development and current framework of public policy are investigated, and specific foundational legislation is critiqued. Prerequisites: Take SMGT-115; for B.S. in Sustainable Management majors only or permission of Sustainable Management program director.

SMGT-370 Logistics, Supply Chain Management, and Sustainability (3 cr.)
Concepts, functions, processes, and objectives of logistics and supply chain management activities. Activities involved in moving raw materials, inventory, and finished goods from point of origin to point of use or consumption. Planning, organization and controlling such activities. The role of supply chain processes in creating sustainable competitive advantage with respect to quality, flexibility, lead-time, and cost. Customer service, inventory management, transportation, warehousing, supply; chain management, reverse logistics, green supply chains, and international logistics. Prerequisites: Take SMGT-350

SMGT-430 International Management for Sustainable World (3 cr.)
Analysis of the theory and practice of managing international organizations. This includes socio-cultural aspects and group dynamics of international business and service organizations through the study of sustainable management practices - strong profitability, healthy environment, and vital communities. Prerequisites: Take SMGT-235. For B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-435 International Development and Sustainability (3 cr.)
Historical roots of the idea of development, economic theories of growth and their implications for sustainability, and interrelationships, between population growth, food security, poverty, inequality, urbanization, technological change, international trade and environmental change at local, regional and global scales. Contemporary issues and alternatives. Prerequisites: B.S. in Sustainable Management majors only or permission of Sustainable Management program director. Obtain valid permission number for registration.

SMGT-440 Systems Thinking (3 cr.)
Use of systems thinking to apply the concept of sustainability in various business, social, and scientific contexts. Rather than looking at a problem by analyzing component parts, students learn to analyze whole systems. Students model relationships and behaviors to identify leverage points for change.

SMGT-460 Environment and Society (3 cr.)
Introduce the fundamentals of human-environmental interaction; a grasp of how these interactions create problems; and how the elements of social, technological, and personal choices combine to overcome them. Prerequisites: Take SMGT-115; for B.S. in Sustainable Management majors only or permission of Sustainable Management program director.

SMGT-495 Sustainable Management Capstone (3 cr.)
Application and study of sustainable management through the solution of an industry-based project. Implementation of a triple-bottom line solution to industrial or community-based problems will be emphasized. Prerequisites: Must be senior level and obtain permission number for registration.

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SOC Sociology

SOC-110 Introductory Sociology (3 cr.)
SBSCI / SOC, ESC, GLP
Fall, Spring and Summer
Social interaction in human groups; relationships between individual and group; social inequality; basic social institutions, social change and current social trends; the sociocultural diversity of groups; the infrastructure and interrelationships of social organizations; and alternative theoretical perspectives for explaining these social phenomenon.

SOC-225 Social Problems (3 cr.)
SBSCI / SOC, ESB, GLP
Sociological analysis of current social problems in the U.S. and the world.

SOC-250 Social Psychology (3 cr.)
Spring
Theory and application of social interaction; emphasis on communication.

SOC-275 Sociology of Gender Roles (3 cr.)
ESB
Fall and Spring
Sociological analysis of social roles played by the sexes.

SOC-315 Criminology (3 cr.)
Fall and Spring
Sociological analysis of structure and function of criminal law, variables of criminal behavior and operation of criminal justice system.
Prerequisites: take SOC-110.

SOC-325 Sociology of Leisure (3 cr.)
Fall and Spring
Institutional approach to effects of leisure on social structure; values reflected in leisure; problems with increase in leisure resources.

SOC-340 Sociology of Work (3 cr.)
ESC
Fall and Spring
Human behavior in various types of employment and occupations; trends in U.S. occupational structure.

SOC-350 Sociology of Hmong Culture (1 cr.)
ESA

Sociological overview of Hmong cultural values, history, immigration and resettlement experiences, family and clan functions, and spiritual beliefs and practices. **$**

SOC-360 Sociology of Juvenile Delinquency (3 cr.)
Fall and Spring
Theories of delinquency, criminal behavior, and social control in relation to modern institutions in American culture.
Prerequisites: take SOC-110.

SOC-375 Sociology of Minority Groups (3 cr.)
ESA, GLP
Fall and Spring
Social/psychological aspects of interaction between majority and minority groups; trends among minorities in the United States.

SOC-400 Sociology of Altruism (3 cr.)
SBSCI, SOC
Fall
Sociological perspective of altruism explored in the context of volunteer public service, and biographies of exemplary public service participants. Acceptance Into Honors Program.

SOC-410 Sociology of Thailand's Minority Groups: Study Abroad Program (4 cr.)
Study abroad program to Thailand. In-depth experiential learning of Thai minority cultures, including religions, socio-political status, Buddhism, health, education, trafficking of women and children, limited citizenship status, and poverty. Field trips to villages, non-governmental agencies, schools, and clinics**.**

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SOCWK Social Work

SOCWK-205 Introduction to Social Work 3 cr.
Fall and Spring Semesters
Social work as a profession; history and philosophy of social services; information for teachers, counselors and those interested in the field. P: SOC-110.

SOCWK-420 Child and Family Agencies 3 cr.
Fall and Spring Semesters
Social and legal status of children in American society; various social services designed to optimize child's growth and development; nature and needs of families; family service agencies. P: SOC-110.

SOCWK-430 Social Casework Methods 3 cr.
Dynamics of social casework: mobilizing individual capacities and community resources to promote adjustment between client and environment; social change. P: SOC-110.

SOCWK-440 Social Work With Groups 3 cr.
History and contemporary theories of social work with groups and communities; topics include group leadership, group dynamics, treatment and task groups.

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SPAN Spanish

SPAN-103 Elementary Spanish I (4 cr.)
COMSK LANG ESB FGLP Fall and Spring
Understanding, speaking, reading and writing in Spanish. Culture of Spanish-speaking peoples, including those in the United States.Grammatical gender, present and past tense verbs, pronouns, adjectives. Supplementary work with audiotapes and computers. Not available for credit to students who took SPAN-121 or SPAN-122. Only one Spanish course counts toward Ethnic Studies.

SPAN-104 Elementary Spanish II (4 cr.)
COMSK LANG ESB FGLP Spring
Second level of understanding, speaking, reading and writing in Spanish. Topics in the culture of Spanish-speaking people, including those in the United States. Compound verb tenses, the subjunctive and commands. Supplementary work with audiotapes and computers.
P: One year of high school Spanish or SPAN-103 required or SPAN-122.

SPAN-121 Practical Spanish I (2 cr.)
ESB FGLP Fall, Spring and Summer
Pronunciation, basic phrases for everyday situations, comprehension and production of short written and spoken sentences, basic grammar summary, introductory vocabulary, language in Hispanic and Hispanic-American cultural context. Not available for credit to students who took SPAN-103. Only one Spanish course counts toward Ethnic Studies.

SPAN-122 Practical Spanish II (2 cr.)
COMSK LANG ESB FGLP Fall, Spring and Summer
Second quarter college Spanish. Vocabulary, conversational patterns, irregular present tense verbs, regular and some irregular preterite verbs; object pronouns. Spanish language in the context of Hispanic culture. Not available for credit to students who took SPAN-103. Only one Spanish course counts for Ethnic Studies.
P: One semester of high school Spanish or SPAN-121 required.

SPAN-201 Intermediate Spanish I (4 cr.)
HUM FLC ESB FGLP Fall, Spring and Summer
Extensive development of vocabulary including common idioms, aural comprehension, correct pronunciation and recognition of verb tenses. Readings and class discussion based on historical background and contemporary Hispanic life, including Hispanic culture in the United States. Only one Spanish course counts for Ethnic Studies.
P: Two years of high school Spanish or SPAN-104 required.

SPAN-202 Intermediate Spanish II (4 cr.)
COMSK LANG FGLP Fall, Spring and Summer
Complete grammar review of standard Spanish, applicable to both conversational situations and business or personal correspondence. Review of essential vocabulary and

phrases. Accuracy and fluency in spontaneous conversation and free composition.

P: SPAN-104 or three years of high school Spanish .

SPAN-227 Spanish Composition and Conversation I (2 cr.)
COMSK LANG ESB FGLP Fall
Fifth semester college Spanish. Advanced grammar review. Introduction to composition. Writing paragraphs and short essays. Advanced conversation. Emphasis on native-like pronunciation, vocabulary and structural fluency. Only one Spanish course counts as Ethnic Studies.

P: Four years of high school Spanish or SPAN-202 required.

SPAN-229 Hispanic Literature in America (2 cr.)
HUM FLC ESB FGLP Fall and Spring
Sixth semester college Spanish. Themes and techniques of Hispanic literature. Vocabulary in Spanish for discussion of a variety of literary genres. Historical and cultural contexts. Emphasis on increasing oral and written fluency in Spanish.

P: Four years of high school Spanish or SPAN-202 required. **R**

SPAN-304 Latin American Short Story (2 cr.)
HUM FLC FGLP Fall
Introduction to the 20th and 21st century Latin American short story. Vocabulary and readings in Spanish of prominent authors and distinct literary periods of this genre. Related historical and cultural contexts. Taught in Spanish.

P: SPAN-202 or equivalent.

SPAN-318 Cinema for Spanish Proficiency (2 cr.)
Sixth-semester college Spanish course on topics for language practice. Outstanding films from the Spanish-speaking world on themes of cultural relevance; advanced composition; advanced conversation and discussion. Taught in Spanish.
P: SPAN-103, SPAN-104, SPAN-201, SPAN-202, SPAN-227, and SPAN-229.

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SPCOM Speech Communication

SPCOM-100 Fundamentals of Speech (2 cr.)
COMSK Fall, Spring and Summer
Techniques of effective speech: diagnosis of individual needs and training in necessary skills; speaker/listener relations, speech organization, voice, bodily action, language and development of confidence and poise.

SPCOM-101 Forensics (1-2 cr.)
Fall and Spring
Training in speech through instruction in and application of the principles used in intercollegiate forensics program: oral interpretation and original and limited- preparation events. **R**

SPCOM-102 Forensics (1-2 cr.)
Fall and Spring
Training in speech through instruction in an application of the principles used in intercollegiate forensics program: oral interpretation and original and limited- preparation events.
Prerequisites: take SPCOM-101. **R**

SPCOM-103 Forensics (1-2 cr.)
Fall and Spring
Training in speech through instruction in an application of the principles used in intercollegiate forensics program: oral interpretation and original and limited- preparation events.
Prerequisites: take SPCOM-102. **R**

SPCOM-104 Forensics (1-2 cr.)
Fall and Spring
Training in speech through instruction in and application of the principles used in intercollegiate forensics program; specific emphasis on forensics administration.
Prerequisites: take SPCOM-103. **R**

SPCOM-200 Persuasive Speaking (2 cr.)
COMSK Fall, Spring and Summer
Advanced techniques of speaking; develop skill in audience analysis, speech composition and delivery of various types of speeches; recognize techniques used daily toward individuals and groups.
Prerequisites: take SPCOM-100.

SPCOM-206 Discussion (2 cr.)
COMSK Fall and Spring
Principles and techniques of discussion; leading and participating in symposium, panel, roundtable and other discussion forms.

SPCOM-208 Theory of Communication (3 cr.)
COMSK Fall and Spring
How people communicate with each other; interpersonal, social, technical and business communication, monographs of various communication theorists.
Prerequisites: take SPCOM-100.

SPCOM-210 Interpersonal Speech Communication (2 cr.)
COMSK Fall and Spring
Basic aspects of non-structured, informal speech communication; expression of feelings and intentions and processing of relationships.

SPCOM-236 Listening (2 cr.)
COMSK
Theoretical analysis and practical application of listening concepts. Emphasis on assessment of individual listening skills and methods of improving personal listening techniques used in occupational and personal relationships.

SPCOM-308 Speech Skills For Business and Industry (2 cr.)
Fall, Spring and Summer
Technical speaking; projects in application of speech skills and activities in business and industry.

SPCOM-312 Intercultural Communication (2 cr.)
ESB, GLP Fall and Spring
Communication concepts and strategies in a multi- cultural society with emphasis on the major United States cultural groups: understanding communication norms in one's culture of origin and developing a functional appreciation of the diversity of communication standards among cultures. Prerequisites: take SPCOM-100.

SPCOM-350 Nonverbal Communication (3 cr.)
Spring
Nonverbal communication skills. Theories and research involved in understanding and applying nonverbal skills in personal, professional, and technologically-enhanced environments.

SPCOM-400 Special Topics in Communication Seminar (1-3 cr.)
Current issues or historical topics related to communication. Specific topic will be advertised prior to semester offered. Course may be repeated three times with different topics or issues. Junior level or higher required.
Prerequisites: take SPCOM-100.

SPCOM-414 Interviewing (1 cr.)
Fall and Spring
Principles and techniques for interviewee in employment interviews.

SPCOM-425 Informational Interviewing Skills for Professionals (1 cr.)
Theories and methodologies used in the collection and interpretation of data for research and professional development purposes.
Prerequisites: take SPCOM-100.

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SPED Special Education

SPED-100 Introduction To Special Education 1 cr.
Fall
Introduction to the special education profession. Survey of the history, philosophy, mission, legislation, issues, organization, and resources associated with the profession; and introduction to the professional standards and content guidelines.

SPED-300 Introduction To Individuals With Cognitive Disabilities 3 cr.
Fall
Introduction to etiology of mental retardation; psychological, educational, social and vocational aspects; adjustment techniques used in working with mentally retarded persons.

SPED-301 Learning Disabilities 3 cr.
Spring
Identification, remediation and evaluation of learning disabled; intervention techniques used with adolescents and adults.

SPED-305 Introduction to Early Childhood Special Education 2 cr.
Summer
Introduction to the history and purposes of EC-SE programming, legislation, population receiving services, family intervention, intervention models and issues.
Prerequisites: take SPED-430 and HDFS-124.

SPED-310 Methods, Materials and Curriculum for the Exceptional Child 3 cr.
Fall
Curricular and methodological adaptation for young children with exceptional educational needs in the areas of social-emotional development, manipulative and motor skills, self-help skills, communication, cognitive development, and creative expression. Admission to Early Childhood Special Education Certification track.
Prerequisites: take SPED-305.

SPED-315 Early Childhood Special Education Programming 3 cr.
Spring
Organization and implementation of Early Childhood Special Education programs, including service delivery, program models, consultation and collaboration, and intervention agents.
Prerequisites: take SPED-305 and SPED-310.

SPED-318 Introduction to Teaching and Assessment in Special Education 2 cr.
Fall, Spring and Summer
Provides one-on-one, supervised experience in teaching youth with exceptional education need (EEN). Provides the initial opportunity for the student to teach a young person with EEN in a supervised setting for 50 hours.

SPED-320 Early Childhood Exceptional Educational Needs Assessment 2 cr.

Summer
Assessment and diagnosis of the young child with a suspected disability. Norm referenced, criterion referenced, and play-based assessment in the following areas: cognitive, motor, speech/language social/emotional, and family. Admission to Early Childhood Special Education Certification track. Prerequisites: take SPED-315.

SPED-322 Curriculum and Instruction: Severe Disabilities 2 cr.
Spring
Curriculum and instruction strategies for teaching functional academics, personal/social, vocational, and community living skills to individuals with severe and profound disabilities. Benchmark I completed.
Prerequisites: take SPED-300 and SPED-430.

SPED-323 Mild Disabilities: Social Studies and Science 3 cr.
Fall and Spring
Curriculum and methods of teaching students with mild cognitive, learning, and emotional/ behavioral disabilties in the content areas of social studies, science and in general education. Strategies that facilitate integration, improve maintenance and generalization of skills, promote transitions, increase self-awareness and self-management, and compensate for learning deficits. Benchmark I completed.
Prerequisites: take SPED-300, SPED-301, and SPED-430.

SPED-324 Curriculum and Instruction: Career and Transition Education 3 cr.
Fall
Curriculum and instruction for persons with disabilities in prevocational, career education, career preparation, and transition, stressing collaboration between education, community-based service providers, and families. Benchmark I completed.
Prerequisites: take SPED-300 and SPED-430.

SPED-326 Pre-Student Teaching: Cognitive Disabilities 2 cr.
Fall
Supervised experience in observing, planning instruction, and teaching children and youth with cognitive disabilities in a cross-categorical school environment. Repeatable three times for credit. Benchmark I completed.
Prerequisites: take SPED-300.

SPED-328 Assessment for Individual Education/ Transition Plans 3 cr.
ESC Fall, Spring and Summer
Diagnosing behavior and learning problems of students with exceptional education needs. Preparing individual educational and transitional plans based on comprehensive assessments. Benchmark I completed.

SPED-330 Introduction To Communication Disorders 3 cr.
Fall
Nature, causes of and methods used when working with individuals who have speech and language disorders.

SPED-338 Pre-Student Teaching Children/Youth With Disabilities 2 cr.
Fall, Spring and Summer
Supervised experience in observing, planning instruction, and teaching children and youth with disabilities in a cross-categorical school environment.

SPED-400 Workshop: Topics in Special Education 1-3 cr.
Summer
Current specialized topics studied through experiential activities.

SPED-410 Adaptive Angler Education 1 cr.
Summer
Methods of teaching basic and adapted fishing skills to individuals with disabilities. Successful completion results in Wisconsin DNR Angler Education Instructor certification.

SPED-420 Schools, Families and Community Collaboration 3 cr.
Theory, general principles and procedures for fostering collaborative partnerships among families, professionals, students and other service providers. Focuses on families with children who have disabilities. Benchmark I Completed.

SPED-430 Inclusion of Students With Exceptional Needs 3 cr.
Fall, Spring and Summer
Inclusion of students with exceptional educational needs in the regular classroom setting. Laws, definition, characteristics, adaptations, strategies and transitional services that pertain to persons identified with: cognitive disability, learning disability, attention deficit hyperactivity disorder, emotional disability, autism, traumatic brain injury, speech and language disorders, visual and hearing loss, physical and other health impairments, and gifted and talented.

SPED-440 Diagnosis and Remediation of Literacy And Math Disabilities 4 cr.
Curriculum, methods, assessment and remediation of teaching reading, math, and language to individuals with mild disabilities. Strategies that assess and evaluate, monitor progress, increase, maintain and generalize skills, facilitate integration, and compensate for learning deficits in the general and special education curricula. Benchmark I Completed. Prerequisites: take EDUC-380 EDUC-381 EDUC-382.

SPED-447 Emotional and Behavioral Problems of Children and Adolescents 3 cr.
Spring and Summer
Assessment, identification and evaluation of emotional and behavioral disorders of learners middle childhood through adolescence, including methods of observing, diagnosing, documenting and interpreting. Characteristics of emotional and behavioral disabled learners, including potential concomitant physical, cognitive, or sensory disabilities and psychological, social and environmental factors contributing to childhood emotional and behavioral disorders.

SPED-462 Classroom Management Techniques 3 cr.
Spring
Techniques for motivating handicapped youth, individual and group discipline, behavior modification, educational organization, evaluation, and communication to enhance learning. Benchmark I completed.

SPED-481 Student Teaching: Special Education 4-16 cr.
Fall and Spring
Directed special education teaching and community experience in selected off-campus schools. School of Education permission required.
Prerequisites: take SPED-318, SPED-326, and SPED-462.

SPED-482 Student Teaching Early Childhood -- Special Education 4-8 cr.
Directed teaching and community experiences in selected infant-toddler, preschool, or school based programs for children with disabilities. Admission to Early Childhood Special Education Certification track. Prerequisites: take SPED-320 and SPED-430.

SPED-488 Intern Teaching: Special Education 16 cr.
An alternative method of obtaining Special Education student teaching experience. Interns receive license to teach and salaried appointment in a cooperating school for one semester. School of Education permission required.
Prerequisites: take SPED-322, SPED-323, SPED-324, SPED-326 and SPED-462.

SPED-489 Intern Teaching Early Childhood: Special Education 8-16 cr.
Directed teaching and community experiences in selected infant, toddler, preschool, or primary school-based programs for children with disabilities. **R**
Prerequisites: take SPED-320.

SPED-490 Behavioral Interventions in the Schools 2 cr.
Fall and Spring
Study and practice in Functional Behavioral Assessment and Behavioral Intervention Planning for individualized behavior problems in the PK-12 educational setting using both a direct-service and consultation-collaboration model. Focus on assessment skills to produce data-driven environmental modifications, pro-social replacement behaviors, consequence strategies, and home-school interventions.

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SPSY School Psychology

SPSY-490 Behavioral Interventions in the Schools (2 cr.)
Study and practice in Functional Behavioral Assessment and Behavioral Intervention Planning for individualized behavior problems in the PK-12 educational setting using both a direct-service and consultation-collaboration model. Focus on assessment skills to produce data-driven environmental modifications, pro-social replacement behaviors, consequence strategies, and home-school interventions.

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SRVM Service Management

SRVM-111 Introduction To Global Service (3 cr.)
GLP
Principles of service management with emphasis on trends, career opportunities, and global economic impact of service sectors.

SRVM-210 Service Operations Management (3 cr.)
Examination of the environment in which services operate. The design of service delivery systems is addressed from the perspective of both customer participation and operations efficiency.

SRVM-260 Managing Service Learning (3 cr.)
Manage service-learning systems that respond to community needs. Address the perspectives of not-for-profit and for-profit delivery systems.

SRVM-346 Seminar in Service Management (1 cr.)
Definition and analysis of high performance service management best practices.

SRVM-354 Service Marketing Management (3 cr.)
Marketing management concepts, issues and terminology unique to the service sector. Strategies used by service marketers will be analyzed and contrasted with other economic sectors. Prerequisites: take HT-344 or BUMKG-330.

SRVM-398 Service Management Field Experience (1-2 cr.)
Off-campus work and study in an approved position to better understand the challenges and potentials of various careers in the hospitality area.

SRVM-410 Electronic Service Management (3 cr.)
Overview, identification, and evaluation of service management components of electronic commerce relationships within the market/ workplace.

SRVM-420 International Service Concepts (3 cr.)
GLP
National and cultural constraints and expectations that impact planning, execution, and evaluation of service quality. Cultural, business, managerial and behavioral foundations supporting success in an international service context. Prerequisites: take SRVM-111.

SRVM-421 Customer Interaction Center Management (3 cr.)
Introduction to evaluation, design, maintenance, and management of online telephone technology to provide customer service solutions for industry in customer interaction centers.

SRVM-481 Special Problems in Service Management(1-3 cr.) **R**

SRVM-498 Service Management Field Experience (1-2 cr.)
Off-campus work and study in an approved position to better understand the challenges and potentials of various careers in the hospitality area. Must Have 90 Credits Completed.

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STAT Statistics

STAT-130 Elementary Statistics 2 cr.
ANRSN STAT
Fall, Spring and Summer
Concepts and application of probability and statistics: data analysis (graphical displays, numerical summary measures); probability and probability distributions; concepts of statistical inference (estimation and hypothesis testing). Illustrated with output from statistical computing packages.

STAT-320 Statistical Methods 3 cr.
ANRSN STAT
Fall and Spring
Methods of describing data: graphical methods, numerical summary measures, exploratory data analysis. Probability, probability distributions, expected value. Sampling distributions. Statistical inference: estimation and hypothesis testing for one-sample and two-sample problems. Regression analysis. Demonstrating with standard statistical software packages.

STAT-330 Probability and Statistics for Engineering and the Sciences 3 cr.
Fall and Spring
Exploratory data analysis; basic probability, probability distributions, mathematical expectation, sampling distributions; basic statistical inference (estimation and hypothesis testing); topics in reliability.
Prerequisites: take MATH-154 or MATH-157.

STAT-331 Probability and Mathematical Statistics I 3 cr.
Fall
Sample spaces. Probability functions for discrete and continuous sample spaces. Conditional probability and independence. Random variables; probability density and cumulative distribution functions; joint, marginal, and conditional distributions. Expected values, moments, and moment-generating functions. Binomial, hypergeometric, Poisson, normal, and gamma distributions.
Prerequisites: take MATH-154 or MATH-157. Prerequisite or concurrent enrollment in Math-158.

STAT-332 Probability and Mathematical Statistics II 3 cr.
Spring
Point estimation. Properties of point estimators: unbiasedness, efficiency, consistency, sufficiency. The method of maximum likelihood. Basic concepts of interval estimation and hypothesis testing. Inference in one-sample and two-sample problems. Simple linear regression analysis; the method of least squares. Goodness-of-fit tests. Analysis of categorical data.
Prerequisites: take STAT-331.

STAT-337 Design of Experiments I 2 cr.
Fall
Linear and curvilinear regression, single-factor designs, confidence ellipsoids for means,

blocking, Latin and other squares, factorial designs.
Prerequisites: take STAT-332.

STAT-338 Design of Experiments II 2 cr.
Spring
Fixed-effect, random-effect and mixed models; nested and nested-factorial designs, split-plot designs, confounding in blocks, analysis of convariance, response surfaces, sequential analysis.
Prerequisites: take STAT-337.

STAT-440 Advanced Linear Modeling-Regression and Time Series Analysis 3 cr.
Fall
Multiple regression, inference about regression parameters, remedical regression measures, quantitative and qualitative regression, model selection/validation, nonlinear regression, neural networks, logistic and Poisson regression, generalized linear models, time series, smoothing, stochastic time series, moving average and autoregressive models, auto regressive integrated moving average (ARIMA), estimating and forecasting with time series.
Prerequisites: take STAT-332.

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STMED Science, Technology and Mathematics Education

STMED-160 Introduction to Technology and Science Education (3 cr.)
Fall and Spring
Survey of technology and science teaching including teachers' responsibilities, history, curriculum, literature, current issues and organizations associated with the profession and teaching within K-12 schools.

STMED-260 Curriculum, Methods, and Assessment for Science and Technology (3 cr.)
Foundation in science and technology education curriculum and assessment that includes mission, goals, content, learning outcomes, behavorial objectives, and assessment items.
Prerequisites: take STMED-160.

STMED-390 Laboratory and Classroom Management in Science and Technology (3 cr.)
Fall, Spring and Summer
Laboratory and classroom management strategies, conflict resolution, syllabi, paperwork, grading, communication, managing facilities and equipment, purchasing, maintenance, storage, lab and material safety, safety equipment, liability, and negligence.
Prerequisite: Benchmark I completed.

STMED-401 Capstone: Mathematics and Science Education (1 cr.)
Synthesis of material learned in the math and science education programs and study of educational research, evidence-based practice, and professional development.
Prerequisite: Benchmark I completed.

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SUST Sustainability

SUST-315 Sustainable Engineering (3 cr.)
Impact of engineering and design/manufacturing decisions on the environment. Topics include: sustainability, energy and material flows, risk assessment, multi-use product life cycles, manufacturing process waste streams, sustainable product design issues, end-of-life product handling, and pollution prevention techniques. Junior or higher standing required.

SUST-425 Sustainable Design and Development Capstone (3 cr.)
An application and study of sustainable design and development through the solution of a community-based project. Design of a triple bottom line solution to industrial problems will be emphasized.
Prerequisites: take SUST-315 or DES-431.

SUST-432 Global Sustainability Experience in Design and Manufacturing (3 cr.)
Cross-disciplinary exploration of ecologically friendly design, engineering, manufacturing, and business models. International travel component with corporate, cultural, academic, and civic leaders. Cultural, economic and political influences; product design; manufacturing; sustainability; application of current eco-friendly product design models; research topics; regional global visitation; studio and laboratory experiences; project and presentation. Junior or higher standing required.

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TECED Technology Education

TECED-160 Introduction to Technology Education 3 cr.
Fall and Spring Semesters
Survey of the history, philosophy, mission, curriculum, methods, organizations and resources associated with technology education.
Prerequisite: TECED-160

TECED-205 Teaching Methods Technology/Vocational Education 2 cr.
Fall, Spring and Summer
Study of teaching methods in use in youth and adult shop classes. Instruction planning; lesson presentation with video tape equipment; methods of organization and management; instruction aids; professional ethics.
Prerequisite: TECED-160.

TECED-260 Curriculum, Methods, and Assessment For Technology Education 3 cr.
Fall Semester
Development of rationales, goals, content outlines, outcomes, objectives, activities, and assessment items.
Prerequisites: TECED-160.

TECED-325 Technology for Elementary School Children 2 cr.
Fall, Spring and Summer
Development, philosophy, objectives and course organization for industrial arts for the elementary schools. Suitable laboratory work in woods, metals, plastics and drawing.

TECED-330 Implementing Technology Education 3 cr.
Fall, Spring and Summer
Converts the theory of contemporary technology education programs into instructional materials, facilities, and strategy suited to the secondary and post-secondary school.

TECED-333 Planning Technical/Vocational Laboratories 2 cr.
School shop facility planning: equipment selection, placement, care and management.
Prerequisite: TECED-405.

TECED-340 Middle School Technology Education 2 cr.
Fall, Spring and Summer
Reviews trends and activities in the technology education movement. To update instructors to teach middle school offerings.

TECED-360 Pre-Student Teaching in Technology Education 1 cr.
Fall and Spring Semesters
Observing, experiencing, evaluating, and analyzing teaching and learning in public school settings.
Prerequisites: take TECED-160.

TECED-375 Workshop 1-3 cr.
Current specialized topics in industrial education through experiential activities.
Instructor's consent required.

TECED-398 Field Experience 1-2 cr.
Fall, Spring and Summer

TECED-398E Field Experience 1 cr.
Fall, Spring and Summer

TECED-403 Activities in Technology/Vocational Education 2 cr.
A study and design of learning activities for industrial and vocational education. Learning activities will be developed on selected levels of the cognitive, psychomotor, and affective domains to carry out stated behavioral objectives. An evaluation of the appropriateness of learning activities as presented in contemporary curriculum projects.

TECED-406 Evaluation in Technology/Vocational Education 2 cr.
Fall, Spring and Summer
For industrial arts and vocational/technical teachers in evaluating program and student performance: basis for student assessment, evaluation of manipulative activity and construction of teacher-made tests as applied to all students (including those with special needs). Student evaluation of instructor and instruction.
Prerequisite: TECED-205.

TECED-408 Student Teaching Technology/Vocational Education 8 cr.
Fall and Spring Semesters
Directed teaching and community experiences in selected off-campus schools. Satisfactory health, speech and English. Cumulative GPA of 2.25 or better.

TECED-409 Student Teaching Technology Education 4-16 cr.
Fall, Spring and Summer
Directed teaching and community experiences in selected off-campus schools. SOE permission required. Satisfactory health, speech and English.
Benchmark II completed.

TECED-431 Field Trips to Industry 1-3 cr.
Opportunities are provided for industrial and vocational education majors as well as teachers to accumulate information about industries through local and distant on-site visits to industries. A third credit may be earned by showing evidence of application of data collected in courses being taught. **R $**

TECED-437 Organization/Management of Technical Laboratories 2 cr.
Summer Session
Experience in administration, project development and teaching problems associated with industrial education.
Prerequisite: TECED-205.

TECED-438 Course Construction 2 cr.
Spring Semester and Summer Session
Directed experience in curriculum development and course of study construction for industrial education teachers; development of behavioral objectives and of instructional

materials to help reach these objectives; development of course of study, instructional package/unit of instruction.

TECED-460 Advanced Curriculum, Methods and Assessment for Technology 3 cr.
Spring Semester
Development and implementation of lessons, demonstrations, lab activities, evaluations, and classroom management plans.
Prerequisite: Completion of Benchmark I; TECED-260.

TECED-488 Internship Teaching 2-8 cr.
Fall and Spring Semesters
An alternate method of obtaining student teaching experience. Teacher interns receive a license to teach and salaried appointments in cooperating school systems for one full semester.

TECED-489 Internship Teaching 16 cr.
Fall and Spring Semesters
An alternate method of obtaining student teaching experience. Teacher interns receive a license to teach and salaried appointments in cooperating school systems for one full semester. Admission to student teaching. **R**

TECED-498 Field Experience 1-2 cr.
Fall, Spring and Summer

TECED-498E Field Experience 1 cr.
Fall, Spring and Summer

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TECH Technology

TECH-230 Exploring Technology 2 cr.
TECH Fall, Spring and Summer
Aspects of technology: definitions, present characteristics, history, forecasting, transfer, assessment, impact and systems.

TECH-295 Honors Seminar in Technology 2 cr.
TECH Fall and Spring
Addressesa wide range of technological concepts along with examples of how technology impacts our lives as individuals, a society, and a global community. Delivered in seminar format. Acceptance Into Honors Program.

TECH-332 Futures of Technology 2 cr.
TECH Fall Semester
Concepts of future studies as applied to technology. Exploration of possible alternatives. Techniques and skills for the professional user and the citizen consumer.

TECH-340 Future of Work 1-2 cr.
Future possibilities as to why people work, who will work, and in what conditions. Project probable work parameters from current tends. Relate past, present, and future to students' individual work situations.

TECH-375 Workshop 1-3 cr.
Fall, Spring and Summer
Special topics providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

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THEA Theatre

THEA-131 Theater Practicum .5-1 cr.
HUM CRPRF Fall and Spring Semesters
Participation in acting, stagecraft, lights, sound, makeup, costumes, properties and business in university theater productions. **R**

THEA-232 Introduction to the Theater 3 cr.
HUM CRPRF Fall and Spring Semesters
Development of theater arts from ancient times to present; play styles, production methods and audience appreciation; representative plays.

THEA-334 Contemporary Theater 2 cr.
HUM CRPRF Spring Semester Analysis of selected plays; structure, dramatic content and production methods.

THEA-336 Stagecraft and Scene Design 2 cr.
HUM CRPRF Spring Semester
Technical problems in producing plays; set design; constructing, painting and handling scenery; stage lighting, makeup, costuming, sound and visual effects, organization of production staff.
P: THEA-232.

THEA-338 Play Production 2 cr.
HUM CRPRF Fall Semester
Directing and acting techniques in play production; selecting, rehearsing and producing scenes for class.

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TRANS Transportation/Energy

TRANS-202 Transportation Systems 2 cr.
TECH
Effects of transportation on society. Comparisons of transportation modes on relative costs, speeds, reliability, efficiency, and more. Examination of vehicle structures, propulsion, suspension, guidance, control and support systems.

TRANS-203 Transportation Systems Lab 1 cr.
Applications and reinforcement of transportation modes. Special projects and field trips.

TRANS-204 Energy Technology 2 cr.
TECH
The nature of energy, its discovery, conversion, and harnessing. Economic, environmental, political and social ramifications of energy-related choices.

TRANS-205 Energy Technology Lab 1 cr.
Mechanical, electrical, fluid and thermal power projects.
Prerequisites: take TRANS-204.

TRANS-395 Seminar 1-2 cr.
Specific content is designed to upgrade competencies of participants. Content will change to reflect current state of the art in electricity/electronics or power mechanics. **R**

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TRDIS Transdisciplinary

TRDIS-101 Seminar in Career Exploration 1 cr.
Fall and Spring Semesters
Identification and analysis of individual career interests, values, needs, skills, and goals. Investigation of resources for career planning and development, including educational programs, job market information and employment opportunities. Development of individual career plans.

TRDIS-120 Strategies for Academic Success 2 cr.
Develop study skills strategies, note taking and test-taking techniques, time management, goal setting, and textbook reading comprehension. Application of principles leads to academic success at the university.

TRDIS-200 Short-Term Cultural Experience 1 cr.
GLP Spring Semesters
Short-term travel experience to U.S. regions delivered through Student Support Services grant-funded program. Available to active, participating students. Instructor's consent required. Sophomore level or higher.

TRDIS-297 Wisconsin in Scotland Field Experience 3 cr.
Fall and Spring Semesters
International field experience as unpaid volunteer in a business, educational, social service, or other non-profit organization in Scotland. Must be enrolled in Wisconsin in Scotland study abroad program.

TRDIS-350 Applied Foreign Language Project 2 cr.
GLP
Application of foreign language to the context of a career related to the student's major program. Vocabulary, written communications, and oral interaction in the primary language of the Applied Foreign Language minor. 16 credits in a Foreign Language.

TRDIS-477 International Study 1-16 cr.
Inter-institutional credit exchange for students accepted in university-approved study abroad or international exchange programs offered through the office of international programs at recognized/accredited institutions in other countries. The course may be repeated. **R**

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TRHRD Training and Human Resource Development

TRHRD-360 Training Systems in Business and Industry 3 cr.
Fall, Spring, Summer and Winterm
Types and purpose of training as related to business and industry. Training analysis, content, delivery systems, evaluation and justification for training. Designed for non-education majors.

TRHRD-370 Training Methods in Business and Industry 2 cr.
Fall, Spring and Summer
Identification of training situations where the development and delivery of training is needed. Emphasis is on methods to deliver a training session. Students will be required to make training sessions presentations.

TRHRD-375 Workshop 1-3 cr.
Fall, Spring and Summer
Special topics providing hands-on or experiential learning activities. Specific content and title to reflect the topic of the workshop. **R**

TRHRD-389 Training Internship 2-8 cr.
Fall and Spring Semesters
Opportunities for students to learn and practice training management and instructional techniques through activities and experiences in a training department. Objectives commensurate with student's background and field of training. Activities include designing and implementing training programs in student's major or minor field of study in either industry, business, military or government training programs.
P: TRHRD-360. **R**

TRHRD-400 Workshop 1-3 cr.
Fall, Spring and Summer
Special topics in training and human resource development providing hands-on or experiential learning activities. Specific content and title to reflect topic of the workshop. **R**

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WS Women's Studies

WGS-210 Introduction to Women and Gender Studies 2 cr.
INTER ESB Fall and Spring Semesters
An examination of the experience of women in American society, their past and present contributions and roles, and perspectives on the future.

WS-310 Women's Studies Practicum 1-3 cr.
Application of women's and gender studies principles to the development of leadership skills and service priorities in an organizational environment. P: WS-210.

WS-311 Topics in Women's Studies 1-3 cr.
Exploring, from interdisciplinary perspective, new information and ideas in a selected area of significance to women's studies. P: WS-210. **R**

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